This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

BOSTON
MEDICAL LIBRARY
8 THE FENWAY

BOSTON
MEDICAL LIBRARY
8 THE FENWAY

TRANSACTIONS

OF THE

TWENTY-FOURTH ANNUAL MEETING

OF THE

ALUMNÆ ASSOCIATION

OF THE

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA

MAY 18TH AND 19TH, 1899.

PHILADELPHIA:
PUBLISHED BY THE ASSOCIATION.
1899.

BOSTON MEDICAL
MAR 14 1919
LIBRARY

CATALOGUED
MAR 14 1919
M.E.C.

LIST OF PRESIDENTS

FROM ORGANIZATION.

1875. *Emeline H. Cleveland, M.D.
1879. Elizabeth C. Keller, M.D.
1884. Hannah T. Croasdale, M.D.
1886. Clara Marshall, M.D.
1888. Mary Putnam-Jacobi, M.D.
1891. Elizabeth R. Bundy, M.D.
1893. Mary E. Allen, M.D.
1894. Mary Putnam-Jacobi, M.D.
1895. Elizabeth C. Keller, M.D.
1897. Anna M. Galbraith, M.D.
1899. Lilian Welsh, M.D.

* Deceased.

BOSTON MEDICAL
MAR 14 1919
LIBRARY

CONTENTS.

PAGE

Officers 5
Executive Committee 5
Censors 5
Committees 6
Members 7
Honorary Members 14
In Memoriam 14
Minutes:
- Members in attendance at the Annual Meeting 1899 17
- Invited guests 18
- Report of Recording Secretary 18
- Report of Treasurer 18
- Report of Executive Committee 19
- Report of Board of Censors 21
- Report of Committee on Educational Fund 21
- Report of Library Fund Committee 21
- Report of Committee on Necrology 22
- Report of Committee on Entertainment 23
- Report of Committee on Preventive Medicine 24
- Report of Committee on Alumnæ Representation 25
- Report of Committee on Badges 25
- Report of Committee on Commencement 26

Report of the College 31
Report of the Woman's Hospital Maternity 31
Report of the Maternity Hospital of the Woman's Medical College of Pennsylvania 34
Report of the West Philadelphia Hospital for Women 34
Report of the Hospital and Dispensary of the Alumnæ of the Woman's Medical College of Pennsylvania 37
Valedictory Address. By ANNA M. GALBRAITH, M.D. 39
Communications:
- Pupillary Phenomena in Some General Diseases. By JEANNIE S. ADAMS, M.D. 64
- College Education a Factor in the Physical Life of Women. By ELIZABETH B. THELBERG, M.D. 73
- Chronic Parenchymatous Nephritis Complicated by Purpura Hemorrhagica. with Infection by the Bacillus Aërogenes Capsulatus. By FRANCES C. VAN GASKEN, M.D. 88

PAGE

Communications—*Continued.*

A Bacteriological Study of the Tissues and Fluids in the Case above Reported. By ADELAIDE WARD PECKHAM, M.D. . 95

Report of a Case of Leukæmia. By FRANCES R. SPRAGUE, M.D. 102

Abstract of Paper on "The Treatment of the Insane." By CALISTA V. LUTHER, M.D. 107

The Treatment of Pneumonia. By MARY GREENWALD, M.D. . 109

Report on the Cases of Typhoid Fever Treated in the Woman's Hospital during the Winter of 1898–1899. By ELLA B. EVERITT, M.D. 117

Notes on the Diagnosis and Treatment of Typhoid Fever. By MARY H. COTTON, M.D. 124

Epidemic Influenza. By MARY V. O'CALLAGHAN, M.D. . . 142

The Determination of Sex at Will. By J. GRIFFITH DAVIS, M.D. 148

OFFICERS OF THE

ALUMNÆ ASSOCIATION.

1899–1900.

EXECUTIVE COMMITTEE.

PRESIDENT,

LILIAN WELSH.

VICE-PRESIDENTS,

ELIZABETH L. PECK, RUTH WEBSTER LATHROP.

RECORDING SECRETARY,

GERTRUDE A. WALKER.

CORRESPONDING SECRETARY,

MARTHA G. K. SCHETKY.

TREASURER,

ANNA P. SHARPLESS.

DIRECTORS,

One year: ANNIE BARTRAM HALL.
Two years: ELIZABETH R. BUNDY.
Three years: ELEANOR C. JONES.

CENSORS.

One Year.

CHARLOTTE B. BROWN,
MARY G. HOOD,
IDA E. RICHARDSON.

Two Years.

ELIZABETH R. BUNDY,
ELIZABETH C. KELLER,
MARIE B. WERNER.

Three Years.

RITA B. CHURCH,
N. M. LEAVELL,
CLARA T. DERCUM.

Four Years.

HANNAH T. CROASDALE,
ANNA LUKENS,
MARY PUTNAM-JACOBI.

Five Years.

ADA R. THOMAS,
ADA C. BEDALL,
SARA J. WILLIAMS-VANDERBECK.

STANDING COMMITTEES.

Committee on Education.

One year, HANNAH T. CROASDALE; two years, FRANCES EMILY WHITE; three years, RUTH WEBSTER LATHROP; four years, ELIZABETH C. KELLER, Chairman; five years, ANNA P. SHARPLESS.

Committee on Fellowship.

One year, MARY G. HOOD; two years, ANNA E. BROOMALL; three years, BERTHA LEWIS; four years, MARY PUTNAM-JACOBI, Chairman; five years, REBECCA FLEISHER.

Committee on Library.

One year. FRANCES HATCHETTE; two years, EMMA E. MUSSON; three years, A. HELENA GOODWIN; four years, ELIZABETH L. PECK; five years, ELLA B. EVERITT.

Committee on Necrology.

One year, CALISTA V. LUTHER, Chairman; two years, CAROLINE M. PURNELL; three years, IDA E. RICHARDSON; four years, LUCY N. TAPPAN five years, MARY GETTY.

Committee on Entertainment.

One year, CLARA T. DERCUM; two years, ELIZABETH R. BUNDY, Chairman; three years, MARGARET BUTLER; four years, MIRIAM M. BUTT; five years, ANNINA C. RONDINELLA.

SPECIAL COMMITTEES.

Committee on Preventive Medicine.

IDA E. RICHARDSON, Chairman; FRANCES EMILY WHITE, LENA V. INGRAHAM, BERTHA LEWIS, FRANCES C. VAN GASKEN.

Committee on Alumnæ Representation.

HANNAH T. CROASDALE, Chairman; EMMA V. CULBERTSON, SARAH E. PALMER, LILIAN WELSH, EMMA E. MUSSON

Committee on Badges.

CAROLINE M. PURNELL, Chairman; ELEANOR C. JONES, ELEANOR HEISTAND-MOORE, ELLA L. DEXTER, ELIZABETH D. KANE.

Committee on Commencement.

SARAH H. LOCKREY, Chairman; GERTRUDE A. WALKER, A. HELENA GOODWIN, KATHERINE L. STORM, MAUD BOWYER.

Nominating Committee.

ELIZABETH R. BUNDY, MARIE K. FORMAD, ALICE ROGERS-EASBY, FRANCES HATCHETTE, LUCY N. TAPPAN.

MEMBERS.

		Class of
Adams, Jeannie S.	Philadelphia, Penna.	1891
Adamson-**Reed**, Eleanor	Philadelphia, Penna.	1888
Alexander, Annie A.	Charlotte, N. C.	1884
Allen-**Whitney**, Florence	Augusta, Me.	1882
Allen, Mary E.	Philadelphia, Penna.	1876
Anderson, Ella M.	Philadelphia, Penna.	1893
Archer, Minnie C.	Houston, Texas.	1894
Bacon, Anna L.	Philadelphia, Penna.	1894
Bailey, Lydia Lavinia	Spiceland, Ind.	1894
Baker, Frances N.	Media, Penna.	1877
Baker, Jane R.	West Chester, Penna.	1892
Baldwin, Helen G.	Indianapolis, Ind.	1897
Baldwin, Kate W.	Philadelphia, Penna.	1890
Ballard-**Bushnell**, Sophia B.	Hurley, Wis.	1889
Barker, Edith A.	East Rochester, N. H.	1897
Barnes, Ida C.	Topeka, Kansas.	1890
Barrell, Mary E.	York, Me.	1897
Barton, Amy S.	Philadelphia, Penna.	1874
Bary, Vera F.	Germantown, Penna.	1878
Bassette, M. Imogen	Cooperstown, N. Y.	1887
Bauer, Marie L.	Philadelphia, Penna.	1890
Beall-**Kramer**, Mary	Wheeling, W. Va.	1893
Beaver, Matilda	Philadelphia, Penna.	1899
Bedal, Adelheide C.	St. Louis, Mo.	1891
Beesley, Nellie Everitte	Belvidere, N. J.	1896
Benedict, Celestia A.	Bridgeport, Conn.	1874
Benn, Rachel R.	Tientsin, China.	1890
Bennett, M. Alice	Norristown, Penna.	1876
Betts, Helen L.	Jamaica Plain, Boston, Mass.	1872
Bill, Harriet P.	Waltham, Mass.	1898
Billstein, Emma L.	Philadelphia, Penna.	1893
Bitting-**Kennedy**, Miriam	Yonkers, N. Y.	1889
Blackburn, Ella	New Vienna, Ohio.	1898
Blackburn, Ida E.	Greensburg, Penna.	1895
Blehl, Mary	Philadelphia, Penna.	1874
Blitzstein, Rosalie M.	Philadelphia, Penna.	1898
Boardman-**Pulsifer**, Cornelia L.	Newton Centre, Mass.	1877

		Class of
Bowyer, Maud A.	Philadelphia, Penna.	1898
Brandeis, Florence M.	Louisville, Ky.	1894
Breed, R. Anna	Philadelphia, Penna.	1892
Brensinger, Ellen C.	Philadelphia, Penna.	1885
Brewster, Mary J.	Northampton, Mass.	1892
Broomall, Anna E.	Philadelphia, Penna.	1871
Brown, Amelia E.	Rutland, Vt.	1883
Brown, Charlotte B.	San Francisco, Cal.	1874
Brown, Ellen E.	Chester, Penna.	1881
Brown, Mary	Swarthmore, Penna.	1892
Bryan, Mary E.	Bareilly, India.	1887
Buchanan-**Custer**, Ella M.	Manayunk, Penna.	1883
Buchanan, Mary	Philadelphia, Penna.	1899
Bundy, Elizabeth R.	Philadelphia, Penna.	1884
Butler, Margaret F.	Philadelphia, Penna.	1894
Butt, Miriam M.	Philadelphia, Penna.	1894
Caminade-**Gillespie**, Mary E.	Philadelphia, Penna.	1894
Carpenter, Frances A.	Carpenter, N. B.	1895
Castlebury, Alzine M.	Williamsport, Penna.	1892
Cattell, Frances F.	Philadelphia, Penna.	1896
Cawood, Augusta B.	New York City, N. Y.	1894
Chapin, Laura S.	Philadelphia, Penna.	1888
Charteris, Mary A.	Moncton, N. B.	1894
Christiancy, Mary E.	Brooklyn, N. Y.	1883
Church, Rita B.	Williamsport, Penna.	1874
Clark, Elizabeth M.	Philadelphia, Penna.	1893
Clarke, Ida	Youngstown, Ohio.	1878
Clement, Ruth	Philadelphia, Penna.	1889
Cohen-**May**, Sarah A.	Philadelphia, Penna.	1879
Collins, Elizabeth F.	Norfolk, Va.	1899
Comly-**Dercum**, Elizabeth D.	Philadelphia, Penna.	1888
Cooke-**Kurtz**, Helen	Canton, Ohio.	1884
Copeland-**Coombs**, Irene	St. Joseph, Mo.	1888
Cotton, Mary H.	New York City.	1888
Croasdale, Hannah T.	Philadelphia, Penna.	1870
Culbertson, Emma V. P. B.	Boston, Mass.	1881
Davis, Ella M.	Holyoke, Mass.	1882
Davis, J. Griffith	New York City, N. Y.	1877
Davis, Mary S.	Philadelphia, Penna.	1892
Dercum, Clara T.	Philadelphia, Penna.	1887
Dexter, Ella L.	Boston, Mass.	1881
Dice, Laura J.	York, Penna.	1890
Dickey, Rachel A.	Philadelphia, Penna.	1867
Dougherty, Henrietta M.	Philadelphia, Penna.	1890
Dranga, Amelia Augenia	Pittsburg, Penna.	1897

		Class of
Dyer, Florence A.	Portland, Me.	1894
Eckstein, Mary A.	Philadelphia, Penna.	1890
Evans, Alice Robinson	Youngstown, Ohio.	1898
Evans, Matilda A.	Columbia, S. C.	1897
Everitt, Ella B.	Philadelphia, Penna.	1891
Everitt, Martha S.	Scranton, Penna.	1895
Fairbanks, Annie D.	Northboro, Mass.	1891
Farnham-**Leader**, Alice M.	Lewiston, Me.	1884
Finley, Johanna S.	Altoona, Penna.	1887
Fisher, Mary	Philadelphia, Penna.	1889
Fleisher, Rebecca	Philadelphia, Penna.	1886
Formad, Marie K.	Philadelphia, Penna.	1886
Friedenberger, Katrina	Williamsport, Penna.	1898
Fullerton, Anna M.	Ludhiana, India.	1882
Fulton, Mary H.	Canton, China.	1884
Galbraith, Anna M.	New York City, N. Y.	1884
Galt-**Simmons**, Eleanor E.	Cocoanut Groves, Fla.	1879
Garver, Jane K.	Harrisburg, Penna.	1872
Garvin, May Bell	Philadelphia, Penna.	1895
Gaston, Emma F.	Chicago, Ill.	1876
Gaston, May E.	Somerville, N. J.	1888
Gaston, Ida Estelle	Philadelphia, Penna.	1893
Gates, Mary J.	Taunton, Mass.	1895
Getty, Mary	Philadelphia, Penna.	1890
Gifford, Marion	Philadelphia, Penna.	1895
Gilmore, Amelia W.	Auburn, N. Y.	1888
Goodman, Charlotte E.	Denver, Col.	1893
Goodwin, A. Helena	Philadelphia, Penna.	1889
Green-**Wadsworth**, Mary A.	Philadelphia, Penna.	1887
Greenwald, Mary	Stroudsburg, Penna.	1892
Grier, Eliza Anna	Matthews, N. C.	1897
Grim, Ella Williams	Philadelphia, Penna.	1899
Griscom, Elizabeth W.	Philadelphia, Penna.	1887
Griscom, Mary W.	Philadelphia, Penna.	1891
Gulick, Esther W.	Philadelphia, Penna.	1896
Guston-**Mackie**, Laura V.	Attleboro, Mass.	1874
Hackley, Alice M.	Philadelphia, Penna.	1893
Hall, Annie Bartram	Philadelphia, Penna.	1891
Hallowell, Rebecca C.	Warner, Cal.	1878
Hanchett, Juliet E.	Syracuse, N. Y.	1885
Hand, Anna M.	Cape May, N. J.	1890
Harris, Lilian N.	Delaware, Ohio.	1897
Hatchette, Frances	Philadelphia, Penna.	1886
Haydon, Marie W.	Philadelphia, Penna.	1892
Hayhurst, Susanna	Philadelphia, Penna.	1857

		Class of
Hazlitt-**Upson**, Grace	Glenridge, N. J.	1884
Hedges-**Matzke**, Edith V.	Palo Alto, Cal.	1895
Heron-**Guthrie**, Fanny S.	Glasgow, Scotland.	1880
Herrick, Jessie L.	Elmira, N. Y.	1895
Hersom, Jane Lord	Portland, Me.	1886
Hetrick, Caroline	Putneyville, Penna.	1894
Hibberd-**Allen**, Amy M.	Glen Lock, Penna.	1892
Heistand-**Moore**, Eleanor M.	Woodbury, N. J.	1890
Higgins, Lelia	Strong, Maine.	1893
Hills, J. Ernestine	Willard, N. Y.	1893
Hills, Laura Heath	Willimantic, Conn.	1896
Holmes, Martha C.	New York, N. Y.	1886
Holt, Margaret A.	Philadelphia, Penna.	1893
Hood, Mary G.	Newton Centre, Mass.	1874
Hough, Mary P. H.	Montgomery Co., Penna.	1881
Howe, Elsie B.	New York, N. Y.	1888
Hurd-**Mead**, Kate C.	Middletown, Conn.	1888
Ingraham, Lena V.	Boston, Mass.	1883
Ingram, Emily J.	Philadelphia, Penna.	1883
Israel, Clara T.	Philadelphia, Penna.	1896
Ives, S. Edith	Philadelphia, Penna.	1898
Jackson-**Ferris**, Anna B.	Philadelphia, Penna.	1874
Janney, Frances S.	Riverton, N. J.	1890
Jenks-**Southern**, Jane M.	Atlantic City, N. J.,	1889
Johnson, Sophia E.	Jhelum, Punjab, India.	1888
Jones, Eleanor C.	Philadelphia, Penna.	1887
Jones, Florence Leigh	Brooklyn, N. Y.	1895
Jones, Mary A. D.	New York, N. Y.	1875
Jones, Mary S.	Boston, Mass.	1892
Kane, Elizabeth D.	Kane, Penna.	1883
Karmarkar, Gurubai	Bombay, India.	1892
Keller, Elizabeth C.	Jamaica Plain, Boston, Mass.	1871
Kirshbaum, Helen	Philadelphia, Penna.	1893
Kleckner-**Saltzgiver**, Sarah S.	York, Penna.	1861
Kugler, Anna S.	Guntoor, India.	1879
Ladd-**Hall**, Carolyn C.	Haverford, Penna.	1889
Lake, Eva W. F.	Pleasantville, N. J.	1891
Lathrop, Ruth Webster	Philadelphia, Penna.	1891
Laughlin, Rebecca Prather	Greencastle, Penna.	1897
Lawrence, N. Louise	New Bedford, Mass.	1896
Leavell, N. M.	St. Louis, Mo.	1865
Le Fevre, Adrienette L.	Blackwoodtown, N. J.	1889
Leo, Johanna Baptistella	New York, N. Y.	1897
Lewis, Bertha	Philadelphia, Penna.	1893
Lippert, Frieda E.	New York City, N. Y.	1889

		Class of
Littell, Alice	Florence, Italy.	1893
Lockrey, Sarah H.	Philadelphia, Penna.	1888
Lord, Helen A.	Englewood, N. J.	1896
Lovelace, Elizabeth M.	Montgomery, Penna.	1895
Lovell, Martha E.	Cavendish, Vermont.	1899
Lucas, Emma Johnson	Peoria, Ill.	1892
Lukens, Anna	New York, N. Y.	1870
Luther, Calista V.	Newark, N. J.	1885
McAllister, Anna M.	Philadelphia, Penna.	1873
McBride, J. L. W.	Mansfield, Ohio.	1894
McCalmont-**Stone**, Harriette O.	Kalamazoo, Mich.	1893
McCollin-**Tatem**, Mary B.	Haverford, Penna.	1889
McCune, Mary V.	Philadelphia, Penna.	1895
Macfarlane, Catharine	Germantown, Penna.	1898
McKeon, Katherine Sophia	Bristol, R. I.	1897
McKirachan-**Lyons**, M. Hannah	Oxford, Penna.	1893
McLean, Mary L. E.	Brooklyn, N. Y.	1887
McMillan, Ellen	Canonsburg, Penna.	1895
Marsh, Caroline H.	New Brunswick, N. J.	1890
Marshall, Clara	Philadelphia, Penna.	1875
Martine, Angeline	Utica, N. Y.	1892
Mayo, Florence	Philadelphia, Penna.	1890
Miesse, Katharine, De W.	Easton, Penna.	1889
Miller, Elizabeth K.	Philadelphia, Penna.	1895
Mitchell-**Green**, Mary V.	Swarthmore, Penna.	1884
Morgan, Rose	Warrenville, Penna.	1895
Miller, Mary Thomas	Philadelphia, Penna.	1899
Munhall, Katharine S.	Buffalo, N. Y.	1893
Munro, Catherine	Providence, R. I.	1899
Munro, Sarah R.	Milwaukee, Wis.	1872
Musson, Emma E.	Philadelphia, Penna.	1883
Northrop, Katharine	Wernersville, Penna.	1889
Osmond, Martha E.	Hulmeville, Penna.	1898
Otis, Susan G.	Auburn, N. Y.	1884
Palmer, Sarah E.	Boston, Mass.	1880
Patterson, Ellen James	Allegheny, Penna.	1898
Peabody, Anna M. E.	Zanesville, Ohio.	1883
Peck, Elizabeth L.	Philadelphia, Penna.	1885
Peckham, Katharine A.	Boston, Mass.	1889
Peeples, Rebecca R.	Philadelphia, Penna.	1895
Philbrick, Inez C.	Lincoln, Neb.	1891
Piper-**Houck**, Mary R.	La Crosse, Wis.	1887
Platt, Mary H.	Philadelphia, Penna.	1891
Potter, Frances W.	South Framingham, Mass.	1891
Powles-**Herman**, Ella	Philadelphia, Penna.	1892
Presley, Sophia	Camden, N. J.	1879

		Class of
Preston, Mary	Wernersville, Penna.	1884
Price, Hannah	Chester, Penna.	1881
Purnell, Caroline M.	Philadelphia, Penna.	1887
Purte, Harriet L. N.	Philadelphia, Penna.	1894
Putnam, Emma	Poughkeepsie, N. Y.	1883
Putnam-**Jacobi**, Mary	New York, N. Y.	1864
Randolph, Anna Moon	Philadelphia, Penna.	1899
Reid-**Keefer**, Jane	Sterling, Ill.	1889
Reifsnyder, M. Elizabeth	Shanghai, China.	1881
Reiser, Magdalena B.	Mayville, N. Y.	1895
Reynolds, Anna M.	Philadelphia, Penna.	1885
Richards, Emma E.	Norristown, Penna.	1886
Richards, Florence Harvey	Philadelphia, Penna.	1899
Richardson, Bertha S. Hatfield	Philadelphia, Penna.	1892
Richardson, Emma M.	Camden, N. J.	1898
Richardson, Ida E.	Philadelphia, Penna.	1879
Rickards, C. F. J.	Watkins, N. Y.	1894
Ridgway-**Zeigler**, Ella M.	Philadelphia, Penna.	1874
Robbins, Rachel	Pittsburg, Penna.	1898
Rogers-**Easby**, Alice	Media, Penna.	1884
Rondinella, Annina C.	Philadelphia, Penna.	1899
Satterthwaite, Laura H.	Trenton, N. J.	1888
Saylor-**Brown**, Jean	Philadelphia, Penna.	1874
Scarlett-**Dixon**, Mary J.	Philadelphia, Penna.	1857
Schermerhorn, Grace C.	Jefferson, Iowa.	1896
Schetky, Martha G. K.	Philadelphia, Penna.	1897
Schneider-**Blum**, Louise	Philadelphia, Penna.	1879
Scott-**Haensler**, A. V.	Philadelphia, Penna.	1875
Seabrook, Alice M.	Philadelphia, Penna.	1895
Sechrist, Cora Stalling	Canton, Ohio.	1896
Sharpless, Anna P.	Philadelphia, Penna.	1889
Sherman, Mary H.	Brookfield, Mass.	1891
Sherman, Jeannette Hurd	Elgin, Ill.	1899
Shimer-**Thompson**, Ida M.	Brattleboro, Vt.	1885
Shrom, Laura Gardiner	Pittsburg, Penna.	1898
Sibley-**Lee**, Florence M.	Philadelphia, Penna.	1884
Simpson, J. Phandora	Christianburg, Va.	1898
Skidelsky, Rachel S.	Philadelphia, Penna.	1894
Slaughter, B. Rosalie	Lynchburg, Va.	1897
Smiley, Virginia W.	San Francisco, Cal.	1887
Smith, Caroline E.	Warren, Penna.	1883
Smith, Hila W.	Guthrie, Oklahoma.	1886
Smith, Mary Hopkins	Parkesburg, Penna.	1896
Spencer, Caroline E.	Colorado Springs, Col.	1892
Spiegle, Grace E.	Philadelphia, Penna.	1898
Stanton, Anna M.	New Stanton, Penna.	1897

		Class of
Sterling, Kate L. S.,	New York, N. Y.	1886
Stevens, Edith G.	Coudersport, Penna.	1890
Stewart-**Cogill**, Lida M.	Philadelphia, Penna.	1890
Stockton, Sarah	Indianapolis, Ind.	1882
Stoeckel, Louise M.	Wilkesbarre, Penna.	1890
Storm, Katherine L.	Philadelphia, Penna.	1893
Tappan, Lucy N.	Philadelphia, Penna.	1886
Thomas, Ada R.	Washington, D. C.	1893
Thompson, Hannah M.	Wilmington, Del.	1883
Thompson, H. Adeline	Bridgeport, Conn.	1893
Thompson, Mary Irvin	Lemont, Penna.	1898
Titlow, Bennetta D.	Springfield, Ohio.	1891
Topham, Mary E.	Adirondack Sanitarium, N.Y.	1894
Trout, J. Frances	Lancaster, Ohio.	1893
Tyrrell, Esther M.	Canton, Ohio.	1894
Van Gasken, Frances C.	Philadelphia, Penna.	1890
Van Horn, Caroline	Englewood, N. J.	1893
Vincent, Charity J.	Allegheny, Penna.	1882
Walker, Della M. S.	Poland, Ohio.	1894
Walker, Gertrude A.	Philadelphia, Penna.	1892
Waln, Emma C.	Williamsport, Penna.	1893
Ward, Lettie Allen	Philadelphia, Penna.	1898
Ward, Mary C.	Philadelphia, Penna.	1895
Waterman, Helen J.	San Diego, Cal.	1897
Waterman-**Wyeth**, Emily	Philadelphia, Penna.	1887
Watson, Florence Hull	Norristown, Penna.	1892
Webb, Ella S.	Oxford, Penna.	1885
Weidner, Frances	Chester, Penna.	1888
Weintraub, S. Louise	Philadelphia, Penna.	1883
Welsh, Lilian	Baltimore, Md.	1889
Wenzel, Mary	Philadelphia, Penna	1897
Werner, Marie B.	Philadelphia, Penna.	1880
West, Charlotte C.	Philadelphia, Penna.	1894
Westbrook, Henrietta P.	Philadelphia, Penna.	1880
White, Aileen D.,	Robbinsville, N. J.	1899
White, Amy E.	Coudersport, Penna.	1897
White, Frances Emily	Philadelphia, Penna.	1872
Whitehead, Eugenia	Mt. Holly, N. J.	1892
Whitten, Emily G.	Philadelphia, Penna.	1894
Wilbur, Sarah H.	Springfield, Mass.	1885
Wilcox, Mary R.	Cynwyd, Penna.	1891
Wiley-**Anderson**, Caroline V.	Philadelphia, Penna.	1878
Williams, Augusta G.	Brookline, Mass.	1894
Williams, Rachel A.	Philadelphia, Penna.	1895
Williams-**Vanderbeck**, Sara J.	Fort Lee, N. J.	1890
Williams-**Theodorovitch**, Emma M.	Philadelphia, Penna.	1885

		CLASS OF
WILLIAMSON, KATHARINE A.	Philadelphia, Penna.	1887
WILLITS, MARY	Norristown. Penna.	1881
WILSON, BERTHA	Columbus, Ohio.	1896
WILSON-**Young**, MARY T.	Philadelphia, Penna.	1896
WILSON-**Swan**, RHUY H	Canton, China.	1893
WOLCOTT, GRACE	Boston, Mass.	1884
WOLFENDER-**Battershall**, M. H.	Attleboro, Mass.	1879
WOODBY-**McKane**, ALICE R.	Savannah, Ga.	1892
YHLEN-**Olsen**, CHARLOTTE A.	Philadelphia, Penna.	1873

HONORARY MEMBERS.

Name and residence	*Where graduated.*
ANGELL, ANNA A., Boston, Mass.	College of N. Y. Infirmary.
AVERY, ALIDA C., San Jose, Cal.	N. E. F. Med. Col., Boston, Mass.
BERLINERBLAU, FANNY, Boston, Mass.	University, Berne, Switzerland.
CALL, EMMA L., Boston, Mass.	University of Michigan.
DEVOLL, SARAH W., Portland, Me.	N. E. F. Med. Col., Boston, Mass.
HUSEN, FLORENCE, New York City, N.Y.	University of Michigan.
LAWRENCE, ANNA F., Louisville, Ky.	N. E. F. Med. Col., Boston, Mass.
LOTHROP, HARRIET W., Philadelphia.	Zurich, Switzerland.
MOREY-**Errant**, NETTIE D., Chicago, Ill.	W. Med. College of Chicago.
MORTON, HELEN, Boston, Mass.	N. E. F. Med. Col., Boston, Mass.
PECKHAM, ADELAIDE W., Philadelphia.	College of N. Y. Infirmary.
POPE, C. AUGUSTA, Boston, Mass.	N. E. F. Med. Col., Boston, Mass.
POPE, EMILY F., Boston, Mass.	N. E. F. Med. Col., Boston, Mass.
POST-**Van Orden**, KATE, San Francisco.	University of California.
SHERWOOD, MARY, Baltimore, Md.	Zurich, Switzerland.
SHUEY, SARAH J., Berkley, Cal.	University of California.
WARNER, HELEN F., Detroit, Mich.	University of Michigan.
WEBSTER, HELEN W., New Bedford, Mass.	N. E. F. Med. Col., Boston, Mass.
WILLIAMS, ANTOINETTE, Louisville, Ky.	University of Michigan.
ZAKRZEWSKA, MARIE E., Boston, Mass.	Cleveland Med. College, Ohio.

IN MEMORIAM.

Name.	Date of death.	Residence.	Class.
ABBOTT, LUCY M.	1875	New York City, N. Y.	1865
ADAMS, ANNE S.	1886	McClenny, Fla.	1873
ADAMS, CHARLOTTE G.	....	Boston, Mass.	1853
ADAMS, HARRIET	1886	Palmyra, N. Y.	1859
ALDRICH, OLIVE DEWEY	1896	Philadelphia, Penna.	1874
AUDENRIED, ADA HOWARD	1898	Philadelphia, Penna.	1892
BAILEY, MARY M.	....	. . . . .	1859
BAKER, SIBELLA F.	1879	Chicago, Ill.	1870
BAKER, STRATHMORE M. C. C.	1892	Philadelphia, Penna.	1890
BATES, ELIZABETH H.	1898	Port Chester, N. Y.	1854
BAUGH, ELIZABETH P.	1889	Ashland, Penna.	1857
BELCHER, HARRIET	1887	Santa Barbara, Cal.	1879

Name.	Date of death.	Residence.	Class.
BEVERLY, JULIA A.	1876	Providence, R. I.	1853
BODLEY, RACHEL A.	1888	Philadelphia, Penna.	1879
BRADLEY, MELISSA A.	1878	Wilkesbarre, Penna.	1872
BROOK-**Smith**, HARRIET	1896	Austin, Texas.	1886
BROWNE, JENNIE G.	1877	Chicago, Ill.	1870
CANAVIN, MARGARET C.	1888	Philadelphia, Penna.	1886
CASE, MARY W.	1889	Lansingburg, N. Y.	1881
CLEVELAND, EMELINE H.	1878	Philadelphia, Penna.	1855
COLLINS-**Jones**, ELIZABETH	1896	Philadelphia, Penna.	1856
COOK, FRANCES A.	....	San Francisco, Cal.	1863
COON, SARAH A.	1881	New York City, N. Y.	1868
CURRY, IDA F.	1891	Boston, Mass.	1888
DENLINGER, ELIZA H.	1883	Portland, Oregon.	1883
DODSON, CAROLINE M.	1898	Philadelphia, Penna.	1874
DU BOIS, EMILIE B.	1884	Philadelphia, Penna.	1878
EAGLESON, JENNIE R. M.	1894	Meadville, Penna	1886
ECKHARDT, MARY A.	1887	West Virginia.	1876
EDDOWES, ANNA	1890	Philadelphia, Penna.	1876
ELLIGER-**Piersol**, MINNA	1871	Philadelphia, Penna.	1854
ELLIS HANNAH W.	....	Philadelphia, Penna.	1853
ELLIS, SUSANNAH H.	....	Wm. Penn P. O., Penna.	1852
FEARING, SARAH J.	1896	Denver, Col.	1890
FLEMING, LULU C.	1895	. . . . .	1895
FORBES, ELIZABETH E. F.	1877	Wilmington, Del.	1877
FUSSELL, REBECCA L.	1894	Media, Penna.	1858
GABLE, ELIZABETH	1897	Philadelphia, Penna.	1890
GERRY, RUTH A.	1877	Ypsilanti, Mich.	1865
GILCHRIST, BEATRICE	1881	Edinburgh, Scotland.	1878
GRAVES, ELLEN T.	1892	Kansas City, Mo.	1883
GREENAWALT, W. M.	1874	Lebanon, Penna.	1871
GREENBANK, ELIZABETH H.	1895	Philadelphia, Penna	1888
GREEN-**Cheney**, LUCILLA W.	1878	Nynee Tal, India.	1875
HENDERSON, MARY A.	1880	Philadelphia, Penna.	1878
HIBBERD, SARAH A.	1883	Rochester, N. Y.	1870
HOCHMAN, GEORGINE I.	1898	Philadelphia, Penna.	1896
HOWARD, SOPHIE E.	1893	Fairport, N. Y.	1879
HUGHES, DEBBIE A.	1861	Charleston, Penna.	1856
INGERSOLL, ELLEN	1888	Canton, Ill.	1874
IRISH, DELILA S.	1878	Davenport, Iowa.	1868
JACKSON, MARY K.	1897	Philadelphia, Penna.	1894
JOSHEE, ANANDIBAI	1887	Poona, India.	1886
JUDSON, ELIZA E.	1880	Staten Island, N. Y.	1872
KANE, HARRIET A.	1896	Kane, Penna.	1885
KEITH, NELLIE L.	1884	Geneva, N. Y.	1871
KENDRICK, EMMA J.	1874	Greenfield, Mass.	1873
KING, LUCRETIA	1895	Little Britain, Penna.	1885
MCCLELLAND-**Dunlap**, G. T.	1893	Leland, Mich.	1881
MCDANIEL, ADDIE H.	1887	Isric, N. H.	1881
MARBOURG, W. R. W.	....	Johnstown, Penna.	1869

Name.	Date of death.	Residence.	Class.
MELLEN, ELIZABETH S. . .	....	Philadelphia, Penna.	1859
MINNIS-**Homet,** MARIA . .	1892	Homet Ferry, Penna.	1853
MITCHELL, FRANCES G. . .	....	New York City, N. Y.	1852
MITMAN, ELSIE . . .	1886	Freeburg, Penna.	1882
MOON-**Andrews,** ORIE R. .	....	Scottsville, Va.	1857
MORGAN, MARTHA . . .	1894	Harrisburg, Penna.	1882
NEEDHAM, ELIZABETH W. .	1877	Providence, R. I.	1875
NICHOL, RACHEL J. . .	1881	Zurich, Switzerland.	1879
OSBORN, MARY E. . . .	1896	Canton, Ohio.	1883
PARRY, SUSAN . . .	1890	Doylestown, Penna.	1858
PAYNE, JANE	1882	Mt. Vernon, Ohio.	1861
PRESTON, ANN . . .	1872	Philadelphia, Penna.	1852
PRICE, AMANDA C. . . .	1881	Eagleville, Penna.	1871
RAYMOND, AURELIA F. D. .	1886	Syracuse, N. Y.	1864
RICE, ANNIE E. . . .	1884	Washington, D. C.	1883
ROBINSON, MARY E. . .	1889	Salem, N. J.	1876
ROGERS, PHŒBE A. . . .	1892	Blossburg, Penna.	1883
RUTAN, SARAH J. . . .	1894	Allegheny City, Penna.	1883
SAWIN, MARTHA A. . .	1866	New England.	1852
SCHULTZE, MATILDA . .	1896	Cincinnati, Ohio.	1874
SEELYE, MARY T. . . .	1875	Calcutta, India.	1870
SEWARD, SARA C. . . .	1891	Allahabad, India.	1871
SHATTUCK, ELIZABETH G. .	1865	Philadelphia, Penna.	1864
SMITH, CYNTHIA. . . .	1887	Rochester, N. Y.	1869
SMITH-**Wells,** CAROLINE N. .	1885	Topeka, Kansas.	1868
SMITH-**Wilder,** M. E. . .	1892	Spring Lake, N. J.	1855
SPERRY, EDLA . . .	1880	Pittsburg, Penna.	1871
STACKHOUSE, SUSAN P. .	1888	Fallsington, Penna.	1883
STINSON, MARY H. . .	1889	Norristown, Penna.	1869
STONE, ELSIE P. . . .	1880	Oakland, Cal.	1867
STUBBS, FLORENCE P. . .	1889	Wilmington, Del.	1881
SUTTON, EMMA . . .	....	Providence, R. I.	1886
TAYLOR-**Gordon,** JENNIE M.,	1898	Malarge, Africa.	1892
THOMAS, ELIZA L. S. . .	....	Alliance, Ohio.	1855
UNDERWOOD, CATHERINE J. .	1873	. . . . .	1859
VOWLER, MARY G. . .	1896	Philadelphia, Penna.	1894
WAY, PHEBE M. . . .	1876	Baltimore, Md.	1852
WHITAKER, ELLA M. . .	1881	New Haven, Conn.	1877
WILMARTH, PHILA O. . .	1888	Rodman, N. Y.	1855
WILSON, MARY E. . . .	1898	Lancaster, Penna.	1868
WILSON, PHEBE . . .	....	Hamorton, Penna.	1857
WOOLSTON, HENRIETTA B. .	1887	Mt. Holly, N. J.	1877
YOUNG, GEORGIANA E. . .	1887	Niagara Falls, N. Y.	1878
ZOOK-**Schæffer,** ELLEN E. .	1884	Philadelphia, Penna.	1873

NOTE.—The Recording Secretary, GERTRUDE A. WALKER, M.D., 125 S. Sixteenth Street, Philadelphia, will be glad to receive any corrections to the above list, or any additions which will render it more complete.

MINUTES

OF THE

TWENTY-FOURTH ANNUAL MEETING

OF THE

ALUMNÆ ASSOCIATION

OF THE

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA.

Held at Philadelphia, May 18 and 19, 1899.

FIRST DAY—*Morning Session.*

The twenty-fourth annual meeting of the Alumnæ Association of the Woman's Medical College of Pennsylvania was held in the college building at Philadelphia, May 18 and 19, 1899. The meeting was called to order by the President, Dr. Anna M. Galbraith, of New York.

The following members were present:

Adams, Jeannie S.
Anderson, Caroline
Baldwin, Kate W.
Bary, Vera F.
Blackburn, Ella
Blehl, Mary E.
Bowyer, Maude A.
Brown, Ella E.
Brown, Mary
Bundy, Elizabeth R.
Butt, Miriam M.
Butler, Margaret F.
Clark, Elizabeth M.
Custer, Ella Buchanan
Davis, J. Griffith
Dougherty, Henrietta M.
Easby, Alice Rogers
Evans, Alice R.
Everitt, Ella B.
Fleisher, Rebecca
Formad, Marie
Galbraith, Anna M.
Gaston, Ida E.
Goodwin, A. Helena
Green, Mary S.
Gulick, Esther W.

Hatchette, Frances
Haydon, Marie W.
Hough, Mary P. H.
Israel, Clara G.
Kugler, Anna S.
Leo, Johanna B.
Lewis, Bertha
Luther, Calista V.
Macfarlane, Catharine
Mayo, Florence
Miller, Mary Thomas
Mitchell-Green, M. V.
Peck, Elizabeth L.
Purnell, Caroline M.
Reynolds, Anna M.
Richardson, Emma Miller
Richardson, Ida E.
Rondinella, Annina C.
Schetky, Martha G. K.
Seabrook, Alice M.
Sharpless, Anna P.
Skidelsky, Rachel S.
Spiegel, Grace E.
Spink, Mary A.
Stewart-Cogill, Lida
Tappan, Lucy N.
Vanderbeck, Sara W.
Van Gasken, Frances C.
Walker, Gertrude A.
Ward, Lettie Allen
Ward, Mary C.
Watson, Alice M.
Webb, Ella S.
Welsh, Lilian
Weintraub, S. Louise
Wenzel, Mary

Invited Guest: Elizabeth B. Thelberg, Vassar College, N. Y.

The first business in order was the report of the Recording Secretary. Dr. Van Gasken reported that the minutes of the twenty-third annual meeting of the Association had been printed and a copy of the same sent to each member.

The report was accepted.

The next in the order of business was the report of the Corresponding Secretary, Dr. Martha G. K. Schetky.

To the Alumnæ Association of the Woman's Medical College of Pennsylvania:

The usual correspondence of the year has been attended to. The dues sent to the Treasurer have amounted to $455.67.

Respectfully submitted,

MARTHA G. K. SCHETKY,
Corresponding Secretary.

The report was accepted.

The next in the order of business was the report of the Treasurer, Dr. Anna P. Sharpless:

REPORT OF TREASURER.

Annual Report of Anna P. Sharpless, Treasurer, in account with the Alumnæ Association of the Woman's Medical College of Pennsylvania.

RECEIPTS.

1898.	To balance on hand at last annual report	$159 48
	To Dr. M. G. K. Schetky, Corresponding Secretary	455 67
	To interest on deposit in Provident Life and Trust Company	1 92
	Total	617 07
	Deficit	2 05
		$619 12

DISBURSEMENTS.

1898.	By Dr. E. C. Keller, Chairman Educational Committee		$79 74
	By Dr. Clara Marshall, Chairman Library Committee		79 74
	By Star Kitchen, for lunch		60 00
	By C. F. Simons, for typewriting		7 00
	By M. A. Colbert, stenographic report		25 00
	By Dr. F. C. Van Gasken, Recording Secretary		25 00
	By Austin C. Leeds, printing		2 25
	By Wm. J. Dornan, printing reports	$273 36	
	" " " by-laws, etc.	56 05	
			329 41
	By Dr. Anna M. Galbraith, President, postage		2 00
	By Dr. F. Van Gasken, Recording Secretary, postage, etc.		4 69
	By Dr. Anna P. Sharpless, Treasurer, postage, etc.		2 11
	By unpaid bill, Dr. F. C. Van Gasken, Rec. Sec., postage		2 18
			$619 12

Audited and found correct.

ELIZABETH L. PECK,
GERTRUDE A. WALKER.

The report was accepted.

The next in the order of business was the report of the Executive Committee by the chairman, Dr. Eleanor C. Jones.

To the Alumnæ Association of the Woman's Medical College of Pennsylvania:

The Executive Committee held three meetings during the past year, at all of which the President, Dr. Galbraith, presided. The first meeting was held on May 21, 1898, at Dr. Croasdale's residence, 1525 Walnut Street.

At this meeting the Corresponding Secretary was requested to send invitations to all the alumnæ of the other medical colleges in good professional standing, resident in or near Philadelphia, inviting them to become associate members of our Alumnæ Association. The other business transacted related to framing a programme for the next meeting.

The second meeting was held on November 18th at Dr. Purnell's residence, 132 S. Eighteenth Street. A letter was received from Dr. Mary Putnam-Jacobi, expressing regret that she would be unable to serve on the Fellowship Committee.

The Secretary of the Executive Committee reported that she had been able to get into communication with only four of our alumnæ as the direct result of the circular-letter sent out last spring. Considerable time was spent in still further arranging the programme for the next meeting.

The third meeting of the Executive Committee was held on April 14th at Dr. Jones' residence, 641 N. Eighth Street. At this meeting letters which were received by the President and Secretary from alumnæ in answer to the request for papers was read, and the Secretary reported that fourteen of the alumnæ had promised papers for the next meeting, and fifteen of those written to declined. The number and character of the acceptances promised an interesting and valuable meeting. The Secretary was requested to prepare a preliminary programme and a circular-letter, and these were to be sent to each alumna who should be invited to discuss the several papers of our programme.

Dr. Schetky presented a partial list of alumnæ of the Woman's Medical College of Pennsylvania and of other colleges resident in or near Philadelphia. Dr. Schetky was requested to send application-blanks to alumnæ of other medical colleges (in good standing) resident in or near Philadelphia, with a view of having them become associate members of the Alumnæ Association.

A vote of thanks was received from the New York Academy of Medicine for one copy of the Alumnæ Association Proceedings of 1898.

The Treasurer, Dr. Sharpless, reported that all bills owed by the Association had been paid.

The President read a letter received from Mrs. Mitchell, a member of the Board of Corporators of the Woman's Medical College of Pennsylvania, reciting her unsuccessful efforts to secure assistance from the alumnæ in raising money for the Fellowship Fund. She proposed dividing the alumnæ into three classes of subscribers: the first, of $5 each; the second, of $1 each; and the third, of $10 each.

The correspondence of the Secretary of the Executive Committee with the different alumnæ has been very voluminous this year; she has sent out more than one hundred and twenty-five letters, including the circular-letters, and the programme promised to be a very full and valuable one. But the unexpected withdrawal of four papers within the last few days interferes very seriously with the result the committee has been laboring for many months to obtain.

ELEANOR C. JONES,
Secretary Executive Committee.

The report was accepted.

The next in order of business was the report of the Board of Censors, Dr. Hannah T. Croasdale, chairman. The Board of Censors recommended that membership be granted to the following applicants, subject to the approval of the Association:

Names of Applicants.

Jeannie S. Adams, 1891.
Jane R. Baker, 1892.
Matilda Beaver, 1899.
Mary Buchanan, 1899.
Elizabeth F. Collins, 1899.
Ella William Grim, 1899.
Mary P. H. Hough, 1881.
Martha E. Lovell, 1899.
Mary Thomas Miller, 1899.
Catherine Munro, 1899.
Anna Moon Randolph, 1899.
Florence Harvey Richards, 1899.
Annina C. Rondinella, 1899.
Jeannette Hurd Sherman, 1899.
Aileen D. White, 1899.
Mary Willetts, 1881.

The applicants were received into active membership.

Reports of Standing Committees were then called for by the President.

REPORTS OF STANDING COMMITTEES.

Report of Fellowship Committee.

Dr. Lewis, chairman, reported that nothing had been accomplished, as her appointment had come late in the winter.

The report was accepted.

Report of Committee on Educational Fund.

The Committee on Educational Fund respectfully submits the following report:

Balance in Treasury, 1898	$483 56
Received from Treasurer, 1898	79 74
Interest	22 50
In Treasury, 1899	$585 80

Elizabeth C. Keller,
Chairman.

May 12, 1899.

The report was accepted.

Report of Committee on Library.

Balance, May 31, 1898	$36 30
Received, May 31, 1898, from the Treasurer	79 74
	$116 04

The Following Volumes were Purchased.

Jewett's Practical Obstetrics	$5 00	
Cabot's Examination of the Blood	3 25	
Stengel's Pathology	4 00	
Balfour's Senile Heart	1 20	
Manson's Tropical Diseases	3 50	
Kalynack's Renal Growths	4 00	
Bastian's Aphasia	3 20	
Richter's Organic Chemistry	3 00	
Slater's and Spitta's Atlas of Bacteriology	2 63	
Davenport's Experimental Morphology, Vol. I.	2 00	
Holt on Diseases of Children	6 00	
Meigs' Origin of Disease	5 00	
Senn's Pathology and Surgical Treatment of Tumors	6 00	
Tillman's Surgery (3 vols.)	15 00	
American Text-book of Gynecology	6 00	
Mills' Nervous System	6 00	
Senn's Tuberculosis of the Genito-urinary Organs.	3 00	
Subscription to Index Medicus	25 00	
	$103 78	
Balance in Library Fund, May 18, 1899	12 26	
		$116 04

Donation.	*Presented by*
"Diagnosis by the Urine," by Menninger.	P. Blakiston's Son & Co.

CLARA MARSHALL,
Chairman.

The report was accepted.

REPORT OF COMMITTEE ON NECROLOGY.

The Committee reported the death of Dr. Ada Howard-Audenried, and also that of Dr. Ella B. Barnes. The following account was prepared concerning the life of Dr. Audenried. It has been impossible to obtain, as yet, any account of the life of Dr. Barnes.

Ada Howard-Audenried was born in Philadelphia, and spent her entire life in or near her native city. Her father was William J. Howard, the first attorney of the Pennsylvania Railroad. She entered the Woman's Medical College of Pennsylvania in the fall of 1889, and received her degree of Doctor of Medicine in 1892. Immediately afterward she entered the Woman's Hospital of Philadelphia as *interne*, and served the institution with fidelity and devotion for one year. She then engaged in private practice, having an office at her home outside the city, and another in Philadelphia. She further served the Woman's Hospital as a clinician in the children's department. She

became one of the charter members of the Managing Board of the Hospital and Dispensary of the Alumnæ of the Woman's Medical College of Pennsylvania. For two years she filled the position of assistant to Dr. Seiss in his otological clinic at the Polyclinic Hospital. The special knowledge and experience there acquired she put into active use at the Alumnæ Dispensary, where she built up a large and successful clinic in ear, nose, and throat diseases.

In the midst of her progress and her enthusiastic devotion to her medical interests she was stricken with a mortal disease, and on August 16, 1899, she died.

She will ever be remembered by her associates as one of the most truly unselfish and most widely philanthropic women among our number.

CALISTA V. LUTHER,
Chairman.

The report was accepted.

REPORT OF COMMITTEE ON ENTERTAINMENT.

The annual supper was given in the gallery of the Art Club, on South Broad Street. The number present was seventy-eight. A reception, preceding the supper, was held at 8 o'clock, at which the guests were presented by Dr. Musson and Dr. Schetky to Dr. Galbraith, President of the Association; Dr. Jones, First Vice-President, and Dr. Marshall, Dean of the College.

Dr. Marshall presided at the supper, and proposed the following toasts:

"Women in the Learned Professions." Response for the Law, by Miss Diana Hirschler; for the Ministry, by Rev. Anna Shaw; for Literature, by Mrs. Margaret E. Leicester-Addis, and for the Medical Profession, by Dr. Thelberg, of Vassar College, and Dr. Gertrude A. Walker.

"Our Fellowship Fund," response by Mrs. Lucretia M. B. Mitchell.

"Our Country," which was drunk standing, response general.

The floral decorations were given by Dr. Harriette O. McCalmont-Stone in the name of the Class of '93. Contributions to the Guest Fund, ranging from fifty cents to two dollars and a half, are acknowledged with thanks.

The price of tickets was $2.50, and the committee are hoping that the subscriptions to the Guest Fund in 1900 will enable them to fix a similar price for the supper of that year.

ELIZABETH R. BUNDY,
Chairman.

The report was accepted.

The President then requested the reports of Special Committees.

REPORTS OF SPECIAL COMMITTEES.

Report of Committee on Preventive Medicine.

The only meeting of your Committee on Preventive Medicine was held in June, 1898. Drs. White, Van Gasken, and Richardson were present. Two of the original committee declining to serve, their places were filled by Drs. Ingraham and Lewis.

Your chairman addressed a communication to Dr. Ingraham covering the legacy of $500 left by Dr. Stackhouse. In reply Dr. Ingraham stated that said $500 was not left to the Alumnæ, but was left with her to be disposed of in college work, as she should approve. Your committee unanimously agreed it would be best to await the completion of the new college building, and then use the money we have in the treasury toward the thorough equipment of a Department for the Instruction in Physical Training, Orthopedics, and Remedial Movements.

Your chairman herewith attaches an itemized statement of the subscriptions received for the fund, with interest accumulations, showing the total amount on hand to your credit on January 1, 1899, as $850.39, as follows:

Memorandum of Subscriptions Received by Ida E. Richardson, M.D., for the Chair of Preventive Medicine.

Amount on hand, June 10, 1890	$191 35	
Subscription June 14, 1890	20 00	
Subscription September 24, 1890	10 00	
Interest for 1890	2 13	
Balance on hand, January 1, 1891		$223 48
Subscription February 14, 1891	$10 00	
Subscription February 21, 1891	50	
Subscription May 2, 1891	10 00	
Interest for 1891	4 67	
Balance on hand, January 1, 1892		$248 65
Subscription April 4, 1892	$30 00	
Subscription July 8, 1892	100 00	
Subscription July 12, 1892	100 00	
Subscription July 19, 1892	2 00	
Subscription July 21, 1892	100 00	
Subscription September 4, 1892	25 00	
Subscription November 2, 1892	5 00	
Interest for 1892	7 25	
Balance on hand, January 1, 1893		$617 90

Subscriptions March 25, 1893	$50 00	
Subscriptions April 27th, 1893	180 00	
Interest for 1893	12 33	
Balance on hand, January 1, 1894, . .		$860 23
Interest for 1894	$15 40	
Interest for 1895	15 71	
Interest for 1896	16 03	
Interest for 1897	16 35	
Interest for 1898	16 67	
Total amount on hand to the credit of the committee, January 1, 1899 . . .		$940 39

IDA E. RICHARDSON,
Chairman.

The report was accepted.

REPORT OF COMMITTEE ON ALUMNÆ REPRESENTATION.

The Committee on Alumnæ Representation takes pleasure in reporting that the past year has given encouragement in believing that some progress has been made, for some members of the Board of Corporators who have hitherto been strongly opposed to having a representative from among the members of our Alumnæ Association upon the Board of Corporators of the Woman's Medical College of Pennsylvania are now speaking very favorably of it. We believe with judicious management we may be able in the near future to secure for one of our number the very important position on the Board of Corporators, believing it will aid in procuring the highest interest of our Alma Mater.

Very respectfully,
HANNAH T. CROASDALE,
Chairman.

May 18, 1899.

The report was accepted.

REPORT OF COMMITTEE ON BADGES.

At a meeting of the Committee on Badges, held on May 11th, a number of designs were submitted for our consideration. From the number we have selected one which seems to us appropriate and at the same time artistic. It consists of a circle, one-half of which is enamelled gray and the other red, with the name of the Association and the motto *KAT' 'EΞOXH'N* (By excellence pre-eminence) upon it. Resting obliquely upon the circle is the staff of Esculapius with serpent entwined about it. This is of gold. The size of the pin can be made smaller than a dime. In lots of twenty the cost of the pin in silver gilt would be $1.00, and in 14k. solid gold the price would be $2.50. Some of the pins could be of silver and some of gold. The

pin can be obtained from Joseph K. Davison, 718 Sansom Street, Philadelphia.

CAROLINE M. PURNELL,
Chairman.

The report was accepted; also the design as presented by the chairman.

The thanks of the Association were extended to the Committee on Badges, and the Committee discharged.

REPORT OF COMMITTEE ON COMMENCEMENT.

The Committee on Increase of Attendance at Commencement would report several conferences with the Dean and Sub-Dean, personally and by letter, both of whom did everything in their power possible to help along the work of the Committee. The Committee's suggestion that a distinguished person be invited to address the graduates at commencement was acted upon, and Judge Ashman delivered a very acceptable address yesterday. The Committee distributed four hundred general admission tickets to the Alumnæ of our college and has reported to the Dean that next year eight hundred could be profitably distributed in that way. There was the best attendance yesterday at commencement we have had for several years.

SARAH H. LOCKREY,
Chairman.

May 18, 1899.

The report was accepted.

The President then read her valedictory address, entitled "Are the Dangers of the Menopause Natural or Acquired?" after which the session adjourned for luncheon.

Afternoon Session.

At 2 o'clock the Association went into executive session, and was called to order by the President.

The first in order of business was the report of the Nominating Committee, which presented the following ticket:

For President, Dr. Lilian Welsh.

For First Vice-President, Dr. Elizabeth L. Peck.

For Second Vice-President, Dr. Ruth Webster Lathrop.

For Recording Secretary, Dr. Gertrude A. Walker.

For Corresponding Secretary, Dr. Martha G. K. Schetky.

For Treasurer, Dr. Anna P. Sharpless.

For Directors: To serve for three years—Dr. Eleanor C. Jones, to take the place of Dr. Anna M. McAllister, whose term has expired, and Dr. Elizabeth R. Bundy.

For Censors: To serve for four years—Drs. A. R. Thomas, Ada C.

Bedall, Sara Williams Vanderbeck, to take the place of Drs. Louise Schneider-Blum, Emma F. Gaston, and Sarah E. Palmer, whose term has expired.

For Committee on Education: To serve for five years—Dr. Anna P. Sharpless, to take the place of Dr. Mary E. Allen, whose term has expired.

For Committee on Fellowship: To serve for five years—Dr. Rebecca Fleisher, to take the place of Dr. Miriam Kennedy, whose term has expired. To serve for four years—Dr. Mary G. Hood, to take the place of Dr. M. Putnam-Jacobi, resigned.

For Committee on Library: To serve for five years—Dr. Ella B. Everitt, to take the place of Dr. Clara Marshall, whose term has expired.

For Committee on Necrology: To serve for five years—Dr. Mary Getty, to take the place of Dr. Emma E. Richards, whose term has expired.

For Committee on Entertainment: To serve for five years—Dr. Annina C. Rondinella, in place of Dr. Rachel Williams, whose term has expired.

As there were no nominations from the floor, Dr. Van Gasken moved that the Secretary be empowered to cast the ballot for the ticket presented by the Nominating Committee. Carried.

The next in the order of business was the appointment from the floor of the Nominating Committee for 1900, which resulted as follows:

Drs. Elizabeth R. Bundy, Marie K. Formad, Alice Rogers-Easby, Frances Hatchette, and Lucy N. Tappan.

A paper was then read by Dr. Jeannie S. Adams, entitled "Pupillary Phenomena in Some General Diseases." Discussed by Drs. Peck, Bundy, and Purnell.

Then followed a paper by Dr. Elizabeth B. Thelberg, of Vassar College, on "College Education a Factor in the Physical Life of Women." Discussed by Drs. Lewis, Spiegle, and Welsh.

Dr. Frances C. Van Gasken then read a paper entitled "Chronic Parenchymatous Nephritis Complicated by Purpura Hemorrhagica, with Infection by the Bacillus Aërogenes Capsulatus." Dr. Adelaide Ward Peckham presented notes concerning the bacteriological findings in the case. Discussed by Drs. Everitt and Israel.

The meeting was then adjourned until the following morning.

SECOND DAY—*Morning Session.*

The meeting was called to order by the President, Dr. Galbraith.

Dr. Van Gasken presented the following communication from Dr. Pennington:

To the Alumnæ Association of the Woman's Medical College of Pennsylvania:

It is proposed to utilize the Physiological Laboratory for a students' room, tearing down the partition, so giving the benefit of the fireplace, and making other suitable alterations. The room must then be furnished, and it is desirable that it should be not only comfortable, but artistic and durable. The students are, of course, anxious to assist as much as possible in the furnishing, but there are many wants, and we know the students' resources are generally limited. I, therefore, lay this matter before you, knowing that you are interested in the progress of the College and the effort which it is making to provide not only the best instruction, but also those comforts without which the students fall short of the best that is in them. I know many of you can easily recall long days in the student years when a few minutes' rest in an easy chair or on a couch would have made a vast difference in the rapidity and the completeness with which the work of the next lecture or laboratory period was accomplished. If, as individuals or as an association, the Alumnæ of the Woman's Medical College can assist the students of to-day and of the future in this work, I would ask that they send all contributions to Mrs. C. N. Peirce, 3316 Powelton Avenue.

Very truly yours, MARY ENGLE PENNINGTON.

Discussed by Drs. Sharpless and Broomall.

A paper was then read by the Secretary, entitled "Report of a Case of Leukæmia," written by Dr. Frances R. Sprague, of San Francisco.

A paper on "The Treatment of the Insane" was then read by Dr. Calista V. Luther. Then followed a paper by Dr. Mary Greenwald on "The Treatment of Pneumonia." Discussed by Drs. Thomas, Richardson, Croasdale, Dercum, Peck, Presley, Lake, Goodwin, Easby, and Galbraith.

Dr. Ella B. Everitt then read a paper entitled "Report of Cases of Typhoid Fever Treated in the Woman's Hospital of Philadelphia During the Winter of 1898-99." Dr. Gertrude A. Walker then read for Dr. Mary H. Cotton a paper entitled "Notes on the Diagnosis and Treatment of Typhoid Fever." These two papers were discussed together by Drs. Peck, Macfarlane, Wenzel, Jones, Allen, and Presley.

The meeting then adjourned until afternoon.

Afternoon Session.

The meeting was called to order by the President.

A paper on "Epidemic Influenza," by Dr. Mary V. O'Callaghan, was read by title.

The report of the College and reports of hospitals were then heard (see Reports, pp. 31–38), after which Dr. Clara Marshall addressed the Association as follows:

I have particularly in mind the celebration of the fiftieth anniversary of the founding of this College. The Faculty has already formed a committee, and to make the celebration a success we most cordially invite the co-operation of the Alumnæ Association. There are one or two ways in which we can add to the interest of this occasion. One is by engaging a distinguished speaker, and we have already secured such a speaker for the 16th of May. Another part of the programme is the unveiling of the portrait of Dr. Ann Preston. Several years ago the Alumnæ instituted this idea, and by carrying it out at this time we shall realize the plans which were then laid but not fulfilled. We have here in the College two portraits of women interested in the College, but none of her who founded the Woman's Hospital and whose name was of such common repute. It seems to me we ought to be able to raise money to have that portrait in our College building, to have it painted by a good artist, and unveiled on the occasion of our Commencement.

Another thought is the possibility of somewhat changing the character of the sessions of the Alumnæ Association. One of the objects of the Association is to further the interests of the College in every way, and I think we could best do that by changing the character of the meeting, making it less a meeting for scientific discussion and more a "taking of stock." We might have a congress of medical women, inviting women from every State. For example, it might be one of Dr. Fullerton's functions, as she is going to India, to write us an account of her work there. With Dr. Reifsnyder in China, and graduates in almost every State in the Union, and a number on the Pacific coast, we might have exceedingly interesting reports. Then we might invite representative medical women to come to us from other countries. Dr. Gertrude Walker will represent our College at the Congress of Women to be held in London in June, and we shall expect a great deal from her. She may be able to tell us whom to invite and who will be likely to respond. It will certainly take two days to tell all that medical women have accomplished in various parts of the world!

Other thoughts have occurred to me which I will not take time to mention. I move that the matter be referred to the Executive Board.

The Association referred Dr. Marshall's report to the Executive Committee with favorable recommendation.

Dr. Marshall moved that the subscription for the portrait of Ann Preston be opened at once. Carried.

Dr. Walker moved that the Association express in some way its interest in the work done at the Alumnæ Dispensary and Hospital. Discussed by Drs. Marshall and Bundy.

The motion was laid on the table until next year.

Dr. Bundy moved a vote of thanks from the Association to the retiring President, Dr. Galbraith, for her great devotion to the work and interests of the Association during her term of office. Carried.

The President then declared the twenty-fourth annual meeting adjourned.

GERTRUDE A. WALKER,
Secretary.

REPORTS.

Report on the College.

Presented by Dr. Clara Marshall, *Dean.*

The most important steps in advance made by the College may be best presented by the following extract from the announcement for 1899–1900:

New Laboratory Building.

A new laboratory building on grounds adjoining those of the College will be ready for occupancy at the opening of the session in October, 1899.

The entire first floor will eventually be used for the training of students in methods of muscular exercise, both for the prevention and the treatment of deformities and of nervous and other diseases, the basement affording space for the necessary rooms accessory to such a department.

The second floor will provide an improved laboratory of physiology and a new lecture-hall.

The third floor, lighted from the roof as well as the sides, will be devoted to the laboratories of histology, embryology, and pathology.

The removal of these laboratories from the main College building will make room there for a laboratory and museum of hygiene, which it is hoped will be equipped for use in the near future, and will provide additional space in connection with the lunch-rooms, study-rooms, etc.

The best features of modern laboratory architecture have been embodied in the construction of the new building, and no expense has been spared in providing for the comfort and convenience of students.

By the courtesy of the Surgeon-in-Chief, students of the fourth year are admitted to the operations at the Kensington Hospital for Women, an institution where a large amount of gynecological surgery is done.

Report of the Woman's Hospital Maternity.

For the College Year, September 21, 1898, *to March* 30, 1899.

During the year of 1898 two hundred and twenty new patients were admitted to the Maternity. Two hundred and eight cases were delivered in the hospital, twenty-one having left before delivery; ninety-

four labors occurred during the College session, twenty-four of which were attended by the students.

There were two twin pregnancies; one went to full term, and the other one ended at the sixth month; the first twins were strong, and left in good condition, the second lived only a few hours.

The antero-posterior measurements of the pelvic brim showed 34 per cent. contractions of the first grade, 3 per cent. of the second grade, and no absolute contractions. It was interesting to note the number of rhachitic pelves and the well-marked characteristics of the disease, even in slight deviations from the normal size.

Among the four albuminuric cases there was one fatal termination after nineteen convulsions; the patient was in the seventh month of pregnancy, and, notwithstanding rapid emptying of the uterus, lived only six hours after admission.

There were seventeen forceps extractions, the chief indications for which were either irregular mechanism of labor or intra-uterine asphyxia; in all cases the instrument was applied to the sides of the head, in strict accordance with the teachings of this school.

During the months of February and March several cases of infection occurred, both purulent and putrefactive in character. Fortunately they were localized, and were limited to puerperal ulcers and endometritis. The general treatment of these septic cases consisted in free alcoholic stimulation and the use of strychnine; the local treatment of the puerperal ulcers was prompt removal of all the stitches, free exposure of the wounds, washing with hydrogen peroxide and boric acid solution, and dressing with dry sterilized gauze. In cases of endometritis there was a thorough exploration of the uterine cavity; if the mucous membrane was found smooth no local treatment was instituted, but dependence was placed on systemic stimulation and the use of protonuclein when the infection was streptococcic. If the endometrium was rough and shaggy, the necrosed tissue was rubbed off with the finger or the dull curette, the uterine cavity washed out with hydrogen dioxide and boric acid or salt solution, and drained with sterilized gauze. This procedure was repeated at intervals of twenty-four hours, and one, two or three times according to indications in pulse-rate and temperature.

The fever was controlled by the ice cap and abdominal ice bag; the action of the skin was stimulated by the dry pack, with copious draughts of hot water; coated tongue and sluggish bowels were corrected by a three-grain dose of calomel, followed by sodium phosphate in teaspoonful doses, two or three times daily.

The uterine secretion was collected in the Menge tube for bacteriological investigation, and subjected to daily examinations in every fever case.

The spread of sepsis led to the adoption of the plan in vogue in some German maternities, of limiting the number of internal examinations in abnormal cases of labor, and managing the normal cases without any internal examination. In pursuance of this method the diagnosis of the presentation and position was made by careful abdominal examination, the stages of labor noted by the change in the character of the pains, and the placental stage, with the exception of abdominal compression of the uterus, was left to a spontaneous termination. The strict observance of this rule led to a prompt disappearance of sepsis, and the ward teaching was continued without interruption.

In the appended list of class work it will be noticed that only twenty-four of the ninety-four women were delivered by the students. In explanation of this it should be remarked that, even under the supervision of the resident physician, only parous women and perfectly normal cases can be intrusted to students. Assisting the delivery of the other cases, many of which were abnormal, afforded additional and valuable opportunities to learn the technique of modern obstetrics.

Examination of blood	34
Women delivered	24
Daily treatment of excoriated nipples	398
After-treatment of primary perinæorrhaphies	57
Treatment of mammary abscesses	2
Urine analyses	878
Examination of human milk	14
Bacteriological examination of vaginal and uterine secretions	32
Examination of pregnant women	143
Examination of parturient women	70
Measuring pelves	68
Removal of perineal sutures	79
Delivery of placenta	10
Intra-uterine douches and packings	20
Daily retraction of foreskins	371
Daily treatment of umbilical wounds	540
Newly-born babies weighed and measured	105
Placentæ weighed	102
Treatment of gonorrhœal vaginitis	24
Treatment of puerperal ulcers of vulva and vagina	17
Daily treatment of vaginal lesions	295
Circumcisions	4
Resuscitation of asphyxiated babies	13
Observations of forceps cases	32
Observations of version	3
Observation of a macerated baby	1
Silver nitrate treatment of eyes of newly-born	19

ANNA E. BROOMALL,
MARY W. GRISCOM.

Report of the Maternity Hospital of the Woman's Medical College of Pennsylvania.

Between May 1, 1898, and May 1, 1899, three hundred and sixty-one confinement cases have been attended on the out-practice.

There has been very little post-graduate work this year, as the senior class took all the summer work, beside the six cases required by the college, and when the seniors finished, in March, the juniors followed, each attending one case. Two or three students profited by all operative cases.

Vaginal and perineal repairs were frequently made by the students, and they assisted the interne in the minor obstetrical operations, under the direction of the Assistant Demonstrator.

The work has been greatly systematized by the appointment of a Matron, who keeps a close record of the whereabouts of the students, registers cases, and distributes calls, so that fewer cases are missed; and she also makes a pleasant home for the students.

The number of abnormal presentations and minor operations has been unusually large, but the only case of unusual interest was an Irish woman, aged thirty-one years, who sent for us after being in labor twenty-four hours. She reported one difficult labor, three years before. We found the posterior wall of the vagina irregularly torn from the uterus down to a fibrous ring about 2 cm. in diameter, situated 3 cm. above the vaginal orifice, and the head of the child in the rectum, bulging the anus.

Incising this ring, we delivered the child anterior to the sphincter ani, hoping thus to save it. The child, a female, weighing eight and a half pounds, was not asphyxiated, although labor began with rupture of the membranes.

We found a vesico-vaginal fistula, and absence, or obliteration of urethra, so it seems scarcely possible she could have had control of her urine, which she claims.

A secondary operation was done after the woman was removed to the nearest hospital, but is reported as only partially successful.

We have had no fatal cases.

Anna E. Broomall,
Mary W. Griscom.

Report of the West Philadelphia Hospital for Women.

Were the statistical report of the West Philadelphia Hospital to be given to-day, it would be in large measure a repetition of that of last year. The amount of work has been much the same, and there have been no important changes in administration. For this reason

Dr. Sharpless, President of the Board of Managers, has asked me to give instead a brief abstract of a few cases that have been treated in the hospital wards.

A large number of these cases have occurred during my own term of service. Naturally, many of those occurring in the service of my colleagues have been or will be reported by them in one way or another, and the medical cases will be most numerous, since they seem to be of most general interest.

The first case is one admitted to my ward in April, 1898, for endometritis. She had a neurasthenic history. The pelvic examination showed the uterus freely movable, anteverted, no pelvic tenderness. A curettement was done, at which time the notes give the uterine measurement three inches; uterus boggy, but freely movable. The patient was discharged May 10th, much improved. She still complained of pulsation along the aorta, which had troubled her for a long time before, ever since doing laundry work.

She returned June 16th with pelvic pain, vesical tenesmus, and an exudate filling the anterior half of the pelvis. The sound passed very high in the bladder. The patient was examined by the aid of the X-rays, but nothing could be made out by that means.

An oöphorectomy was done by Dr. Goodwin, and the peritoneum was found shortened and adherent over the entire left side. The right ovary, large and only slightly adherent, was removed. The left ovary was so embedded in intestinal adhesions that it was impossible to enucleate it. The patient had peritonitis following, and died at the end of a week. The case seems of interest as showing how extensive a peritonitis may exist without fever, distention, or many of the usual signs of the condition.

The case now to be reported illustrates how much some patients may venture and yet escape harm. A. B., aged thirty-eight years, entered Dr. Griscom's ward August 30, 1898. She gave a family and clinical history of cancer of the uterus. Vaginal hysterectomy was done September 3d, a clamp operation. The patient was very restless and uncontrollable, turning from side to side during the first night. When the dressing was forced out by the patient's coughing, she immediately replaced it herself, and during her stay she had indigestion from surreptitiously eating candy, but was discharged in less than four weeks in good condition.

Another patient of Dr. Griscom's, E. R., aged thirty-nine years, was admitted August 9, 1898. The examination on admission showed normal lungs, a mitral murmur, urine negative, though with a low percentage of urea. The blood-count fair, and 60 per cent. hæmoglobin. She was suffering from a subperitoneal fibroid, for which the operation

of myomectomy was done. The patient took ether badly, was cyanosed several times during anæsthesia, although oxygen was administered with the ether. The pulse was good even during the cyanosis. She recovered from the ether in three hours, with no nausea, but cyanosis. Over the lungs coarse râles were heard, and the respiration rate steadily rose. She rallied, and the lungs cleared the morning following the operation, but they soon refilled, and death occurred early in the afternoon of the second day. The autopsy showed mitral stenosis and slight tricuspid stenosis, myocarditis, contracted kidneys, a fatty and cirrhotic liver.

A number of cases of typhoid fever have been treated in the hospital during this winter. As our medical ward has only seven beds, the number at any one time was not large, but several have been of considerable interest. Four cases occurring at nearly the same time were mild in character, so mild that had they not been typical we might not have ventured to call them typhoid fever, but the history, the continuous fever, with morning fall and evening rise of temperature, the enlarged spleen, rose spots, and the positive result of the Widal test left no doubt as to diagnosis.

One case, the only fatal case, L. E., German, aged forty-five years, came into the hospital after two weeks' illness; she walked in, having taken a purgative the day before. On the day of admission tarry stools were passed; there was an engorged right lung, and the patient's mental condition was very apprehensive. On the second day after admission she had eight large intestinal hemorrhages, two small in amount. The temperature, which had been running moderately high, dropped to normal, but there was no marked effect upon the pulse-rate. There was percussion dulness over the cæcum, and subsultus tendinum became marked. Opium was given in the form of the deodorized tincture, by rectum, in full doses, and being rapidly absorbed had a decided effect upon respiration. The patient had to be watched for some hours. Some improvement in her condition followed, and in three days after a normal stool was passed. But the patient's heart failed, and she died two days later, a victim, doubtless, to her treatment of herself the first four days of the fever.

A. W., aged twenty-seven years, had an attack of typhoid fever that would have been uneventful except for chills recurring daily during the third week, accompanied by a rise of pulse and temperature and by extreme nervousness. Early in the disease the blood had been examined for the malarial organism, with negative result. The Widal test was positive. A second examination for malarial organisms was also negative. The recurring chills might be explained by the presence of deep ulceration. A mustard foot-bath seemed to do much to relieve

the nervous condition and to lower the temperature. The patient's stomach was troublesome, and she had rectal feedings for two weeks.

Another case, an epileptic, which I hope sometime to report more fully, had attacks of *grand mal* at frequent intervals during her very severe attack—a most unusual occurrence.

A case of Friedreich's ataxia has been of interest, quite a typical case of that rather rare disease, with family history well marked.

A case of crossed hemiplegia in a child of ten years, due probably to hemorrhage into the pons, was admitted from the Methodist Orphanage, where she had been under Dr. Stewart-Cogill's care. The history shows its beginning in attacks of night-terrors two or three days before the paralysis declared itself. There were accompanying fever and rapid and often very feeble pulse and partial incontinence of urine and feces. There was no loss of consciousness.

A case of Dr. Richardson's developed a hemiplegia with complete loss of speech a week after an operation for pus tubes.

In addition to this brief report of a few cases, I might mention the fall of our porch during the heavy storm of last winter; its rebuilding is now in progress.

Two new beds have been endowed annually: one, a child's bed, by Mr. A. F. Huston, in memory of Elizabeth Huston, and one by Dr. Sharpless, in memory of Ruth Sharpless.

ELIZABETH L. PECK.

REPORT OF THE HOSPITAL AND DISPENSARY OF THE ALUMNÆ OF THE WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA.

The Hospital and Dispensary, founded four years ago by the Alumnæ of the Woman's Medical College of Pennsylvania, outgrew the little house at 1212 South Third Street within twelve months after its work was begun. But not until the present time have the Board of Managers seen the way clear to enlarge their facilities and to make an attempt to carry out that part of the original plan implied by the word hospital. Definite efforts were put forth to secure sufficient funds to purchase the desirable property at 1207 South Third Street, a much larger, more convenient, and a better built house than the one heretofore occupied. Enough money had been secured to pay the amount required to obtain an instalment mortgage, and the papers were in process of preparation, when the Board was most pleasantly surprised by the gift of $5000 from the Mary Jeanes estate, through Anna T. Jeanes, executrix. The corporation, therefore, now fully owns its property at 1207 South Third Street, and begins its fifth year under far brighter financial conditions than it has ever before enjoyed. It is the purpose of the Managers to build up as rapidly as possible a fund to be used

for purchasing additional properties, since
most fitting for the work of a hospital and
children. The number of patients treate
increased from year to year, notwithstar
From October 31, 1895, to May 1, 18
been registered, 4490 of whom are ne
parison of figures for the past two yea

Total No. of new cases . .

No. of visits to medical clinic
" " surgical clinic
" " gynecological
" " eye clinic
" " ear, nose, ar
" " children's
" cases treated by re

Total

Two resident physicia
A. Libby, have served
six months, alternatin
under Dr. Broomall'
Hospital and Dispen
ties for work will be
The institution
Ross, whose work
scriptions have b
The students
interesting cas
poses of instr
No longe
ready an ir
sary adjur
day the
friends
provin
The
contr
hop
the
so

ARE THE DANGERS OF THE MENOPAUSE NATURAL OR ACQUIRED? A PHYSIOLOGICAL STUDY.

VALEDICTORY ADDRESS.

BY ANNA M. GALBRAITH, M.D.,
NEW YORK, N. Y.

MEMBERS OF THE ALUMNÆ ASSOCIATION OF THE WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA,

LADIES: Two years ago you honored me by making me your President, and one year ago I felt that my re-election was a still greater honor. But a third nomination could not be considered, since in so large an organization as this, with its membership spread not only over the United States but many foreign countries as well, the best interests of the Association can only be conserved by rotation in office. At the expiration of two years, your chief servant has had sufficient time in which to infuse her best ideas and energies for the weal of the organization; besides which, vastly greater breadth of view must come from having the officers drawn from all over the country. And while it requires some sacrifice to come from a distance to attend the meetings of the Executive Board, on these meetings to no small extent depend the activity and growth of our Association.

Women naturally possess a spirit of altruism, so it will be all the easier to have our professional lives guided by that noble and lofty ambition which is expressed in the eloquent words of Bacon: "I hold every man a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto." With every member of our Association imbued with this spirit, money must come pouring into the treasury for the Fellowship Fund; and the Executive Committee will find in the many and valuable contributions offered them for the annual programme an embarrassment of riches.

To the present Executive Board I cannot sufficiently express my gratitude for their active support nor the pleasure it has been to work with them. Our most efficient Secretary, Dr. Eleanor C. Jones, has performed the onerous duties of her office with a zeal and enthusiasm which has incited many of her correspondents. But if Dr. Jones labored before the meetings, on our Recording Secretary, Dr. Frances C. Van Gasken, fell the brunt of the work afterward in the collation of the material and the putting in shape a worthy copy of the TRANSACTIONS of our Alumnæ Association.

And to all members of the Association are due my most hearty thanks for the cordial feeling, the kindly good-will, and the unfailing support that have always rendered pleasant all our arduous labors for the weal of this organization.

Before proceeding to my address, it is my pleasant duty to introduce to you our newly-elected President, Dr. Lilian Welsh, of Baltimore. Living in the stimulating atmosphere of the Johns Hopkins University, as she does, the greatness of her schemes for the advancement of our Association must be almost unbounded. And I congratulate the Association on the fact that Dr. Welsh has consented to undertake the heavy responsibilities of the Chair.

Because of the paucity of the literature in our text-books on gynecology on the subject, and the untold suffering and frequent deaths that occur, owing to the ignorance of the general practitioner in regard to the same, I have chosen for my valedictory address the question: "Are the Dangers of the Menopause Natural or Acquired? A Physiological Study."

In this country the education of women is in its infancy.[1] The first college regularly organized for the education of women was Vassar College, which was incorporated in 1861, thirty-eight years ago. Matthew Vassar wrote: "It occurred to me that woman, having received from her Creator the same intellectual constitution as man, has the same right as man to intellectual culture and development. It is my hope to be the instrument in the hand of Providence of founding an institution which shall accomplish for young women what our colleges are accomplishing for young men."

[1] Galbraith, Anna M.: "The Women of Salerno." Transactions of the Alumnæ Association of the Woman's Medical College of Pennsylvania, 1898.

The first medical college regularly organized for this special education of women was the Woman's Medical College of Pennsylvania, incorporated in 1850, eleven years earlier. Thus it is seen that the need of the practical working education of woman was felt before that of her theoretical education. So the cart was placed before the horse; and the natural embarrassment caused by the awkwardness of the situation made itself sharply felt.

By the rapid multiplication of women's colleges, university extension, post-graduate courses, women's clubs and travel, phenomenal changes have occurred in the education of the masses of women and in the mind of the public concerning this change in the social status of women.

Fifty years ago all that woman knew of herself was what man told her, and the definition of a woman might have read thus: "A woman *is* a generative apparatus whose function is to perpetuate the species. She *has* a limited intellect contained in a frail body which is especially liable to be wrecked at the time of puberty, and the danger is still greater at the menopause."

As a matter of fact, the average woman does look forward with the gravest apprehension to "the climacteric" as an awful abyss that must be gotten over or fallen into on her onward journey through life.

Since it is a well-attested fact that dangers *do* attend the menopause, the question is one of vital importance to every woman—are these dangers natural or acquired?

In order to reach any satisfactory conclusion we must consider, first, the etiology of menstruation; second, the physical changes which occur at the time of the menopause, together with the resulting symptoms; third, the pathological conditions which may arise; fourth, measures which may be taken in order to prevent a physiological process from passing into a pathological condition.

The etiology of menstruation has been variously explained at different epochs. The chief theories have been that of plethora, the ovulation, the tubal, and the nerve theory.

First, the Theory of Plethora. From the time of Hippocrates to 1835 the theory prevailed "that in the female body the formation of blood is sufficiently rich to provide every four weeks for an overflow of the same, the evacuation of which becomes a necessity. It was believed that this excess of blood depended upon an excess of formative power in the woman."

Second, the Ovulation Theory. This was distinctly formulated about 1845. It construed the menstrual hemorrhage as a subsidiary phenomenon entirely dependent on the periodical dehiscence of ovules. The changes supposed to take place in the Graafian follicles at each menstrual period were believed to involve a peculiar expenditure of nerve force, which was so much dead loss to the individual life of the woman. The growth of the Graafian vesicle and its contained ovum was supposed to cause an irritation of the nerves of the ovary, which was reflected to the entire nervous system. According to Pflüger, the gradual accumulation of this irritation finally determined by reflex transmission the afflux of blood to the uterus and ovaries, which constitutes the catamenial flow.

The ovulation theory of menstruation was refuted by the following facts: Ovulation may and does occur without menstruation. Women who have never menstruated may conceive. Conception may occur during lactation without the menses having returned since the last parturition. Children at birth have many ovules contained within the ovaries. Ovulation may persist for a time after the menopause, and even pregnancy has occurred, although very rarely, after this time. The menses may continue regular after the removal of the ovaries and Fallopian tubes. This is exceptional, and, as a rule, the periods only continue for two to three years at the longest.

Third, the Tubal Theory. Lawson Tait thought that thorough removal of the tubes was far more essential in determining the menopause, and that cases of periodically recurring hemorrhage after oöphorectomy were to be explained by the fact that the tubes had not been sufficiently removed. As an anatomical and surgical fact, the tubes can never be wholly excised unless the upper part of the uterus is also amputated.

Fourth, the Nerve Theory of Menstruation. This is based upon the following views:

1. That menstruation is a process directly controlled by a nerve centre situated in the lumbar region of the spinal cord.

2. That the menstrual impulses reach the uterus either through the pelvic splanchnics or the ovarian plexus, probably both.

3. That menstruation is the result of nerve irritation, vascular congestion, and subsequent relief of these by hemorrhagic discharges.

4. That hemorrhage from the uterus is either the result of a local uterine condition or of influences outside the uterus acting directly on the centre.

5. That removal of the appendages arrests menstruation by preventing the propagation of uterine impulses to the centre.

According to the researches of Körner, Röhrig and others, the uterus is supplied by two sets of motor nerves. The first are derived from the abdominal splanchnics and pass through the abdominal and hypogastric sympathetic plexuses to the uterus. Stimulation of these fibres causes contraction of the circular muscular fibres of the uterus. The second set of fibres are the pelvic splanchnics which arise in the lumbar part of the cord in the cells of the posterior column of Clark, and are also connected with the cells of the lateral horn of gray matter (Gaskell). They run in the nerve roots of the second and third sacral nerves and pass directly into the hypogastric plexus, from which they are distributed to the generative organs, the bladder and the rectum.

They are chiefly vasodilator in function—*i. e.*, they transmit impulses which bring about vascular engorgement in the viscera supplied. It is probable, therefore, that they are concerned in bringing about the determination of blood to the uterus and appendages, which is such a marked feature of the menstrual process.

Gaskell believes that active tissues are supplied by two sets of nerves—katabolic and anabolic. A katabolic nerve stimulates the destructive metabolism which is always going on in a tissue. It brings about a liberation of energy, followed by exhaustion—*e. g.*, the motor nerves of muscles, the accelerator nerve of the heart, and the sympathetic nerve to the submaxillary gland. An anabolic nerve is the exact opposite to a katabolic in function. It subserves constructive metabolism, produces repair of tissue and building up—*e. g.*, the cardiac branch of the vagus and the chorda tympani.

Martin believes that in the intermenstrual period the uterus is under the control of the anabolic nerves.

The uterus is believed to contain independent or parenchymatous nerve centres which may be excited by suspension of respiration, anæmia, or rapid hemorrhage (Körner, Spiegelberg). Automatic ganglia in the uterine mucosa connected with nerve filaments have been observed by Frankenhäuser. This observa-

tion is supported by Ries' experiments on bitches, which show that although all the nerves going to the uterus be divided, practically all, the functions connected with conception, pregnancy, and parturition can take place, even with the uterus separated from its cerebro-spinal connections.

Active contractions of the uterus may be induced : (*a*) By direct stimulation of the hypogastric plexus (Frankenhäuser). (*b*) By stimulation of the pelvic splanchnics (Von Basch and Hoffmann). (*c*) By direct stimulation of the lumbar part of the spinal cord (Spiegelberg).

The uterus may be made to contract reflexly : (*a*) By stimulating the central end of the sciatic nerve (Von Basch and Hoffmann). (*b*) By stimulating the central end of the brachial plexus (Schlesinger). (*c*) By stimulating the nipple.

Uterine Nerve Centre. The centre for parturition, according to Körner, lies at the first and second lumbar vertebræ. The afferent fibres come from the uterine plexus, to which also the motor fibres proceed. Goltz and Reusberg observed that a bitch became pregnant after its spinal cord was divided at the first lumbar vertebra.

All the centres lying in the lower part of the spinal cord—*e. g.*, those for defecation, micturition, erection, ejaculation—must, like the parturition centre, be regarded in the normal condition, as subject to the control of higher reflex centres in the medulla. The experiments of Osler and Schlesinger confirm these observations. The cerebrum, also, partly by the production of perceptions, partly as the organ of volition, can excite or suppress the action of certain of these subordinate spinal centres.

The Menstrual Centre. Reasoning from analogy that the various pelvic functions are dominated by spinal centres, Mr. Christopher Martin argues for the existence of a menstrual centre situated in the lumbar enlargement of the cord. He pleads that, as the parturition centre has been shown to exist in bitches, there is in all probability also a parturition centre in women, situated about the first and second lumbar vertebræ. If, writes Martin, the parturition centre be found there, the menstrual centre will not be far away. The centre is certainly not in the pelvis. There are ganglia in the substance of the uterus, ganglia in the nerve plexus at the sides of the uterus between the layers of broad ligament, and on the cervix is situated a large ganglionic mass, developed

in connection with the utero-vaginal plexus, called the *ganglion cervicale uteri.* If these ganglia have anything at all to do with menstruation they are certainly controlled by a higher centre.

James Oliver says: "It is therefore more than probable that the physiological changes recurring from time to time in the uterus are anticipated by and in reality the sequence of a molecular disturbance arising spontaneously in some centre located in the higher part of the cerebro-spinal tract, possibly somewhere in the medulla oblongata. All visceral activities are, through habituation, fulfilled in a somewhat automatic manner."

Dr. Arthur W. Johnstone, of Cincinnati, discovered the menstrual nerve, which he believes to stand in the same relation to the uterus as does the chorda tympani to the sublingual gland, or the sciatic nerve to the lower limb. "The closer you get to the uterine body with your excisions the more sure you are to stop menstruation; so, also, the more sure you are to extirpate the whole of the nerve plexus embodied in the tube and broad ligament, thus completely isolating the endometrium from the trophic and vasomotor centre, which control it as they do every other organ. This nerve comes up at such an acute angle with the body of the uterus from deep down in the broad ligament that one must get his ligature around the very origin of the tube if he expects always to secure it. It is probably a mixed nerve, being composed of cerebro-spinal and sympathetic nerves."

Napier says there are several objections to this theory, the primary one being that the menstrual nerve has not been found by other competent observers.

Christopher Martin writes: "I doubt if this be as constant a structure as he would have us believe. It is probable that the ovarian structure contains some of the fibres governing menstruation."

Having made an exhaustive study of the uterine mucous membrane, Johnstone has come to the conclusion that it ought to be regarded as an adenoid or glandular tissue of like structure as the thyroid, spleen, tonsil, and lymph-tissue in the walls of the intestine and lymphatic glands. He holds that in the ordinary acceptation of the term the endometrium is not a mucous membrane but adenoid tissue, and that menstruation is for it what the lymph stream is to the lymph gland or the blood current to the spleen. Johnstone says: "Having satisfied myself that the

corpuscles of the healthy endometrium are never found bifurcating, but that the developmental gradation is always present, I was convinced that the tissue belonged to that class of organs whose function it is to replace organic waste, and it ought to be classed with the spleen and thymus gland instead of the vagina and bladder. Menstruation is a periodic wasting away of those corpuscles that are too old to make a placenta." [1] He has further found that, as compared with the uteri of very many of the lower animals, the human uterus is very scantily supplied with lymphatics, and the only way to rid the uterus of the over-ripe and consequently useless tissue is to wash it out through the vagina by a blood-stream. The tough wall of the human uterus and the increased blood pressure caused by the erect position cause the difference between menstruation in the human female and rut in the lower animals. He indorses the statements of Engelmann, that the mucous membrane is not destroyed, and consequently does not need regeneration between each flow. Bland Sutton also holds the view that only the surface epithelium is shed during menstruation.

E. Tenison Collins says: "Uterine hemorrhage, menstrual or metrorrhagic, is invariably caused by intra-uterine irritation acting reflexly through a nerve centre. Physiologically we have proof of the existence of such a centre, and nerve filaments have been traced into the uterine mucous membrane. Foreign bodies are expelled from the uterus partly by expulsive contractions, partly by blood flux. In tubal disease hemorrhage is common, but the tubes are embryologically part of the uterus. In all these diseases the chief afferent nerve conveying the impulses to the centre is probably Johnstone's nerve. Apart from the local causes of hemorrhage, the centre may, like all others, be affected by the quantity of its blood supply, drugs acting on it, also cardiac, hepatic, or renal disease."

He believes "that the uterine mucosa undergoes progressive construction for the reception and retention of the ovum. Failing this, having reached the highest stage of development, it degenerates and becomes a foreign body, and so acts as a stimulus generating afferent impulses to the utero-ovarian centre."

Christopher Martin says: "In the intermenstrual periods the

[1] British Gynecological Journal, June, 1886, vol. ii. p. 296.

organ is under the control of anabolic nerves, engaged in a constructive metabolism, preparing a decidua, building a nest for the expected egg. But should impregnation not occur within a definite period the katabolic nerves exert their influence and menstruation occurs. The actively growing cells of the endometrium undergo a rapid destructive metabolism, the fabric of the half-formed decidua tumbles to pieces, and the turgid capillaries burst and pour out the menstrual flow, which sweeps away the useless débris." The irritant sets up reflex uterine contractions, and so the blood, according to Dr. Champnay, is squeezed out of the distended capillaries and washes away the degenerated cells.

Napier believes that the cause of the peripheral irritation is the increased size of the utricular glands which press directly on the fine nerve filaments and ganglia in the uterine tissue, also indirectly by filling up the stroma and pressing on the vascular radicles; possibly, also, by the influence of some special glandular secretion.

He says that the time necessary for the growth of the glands to such a size, and probably with such functional activity that they will act as peripheral irritant factors, corresponds to the time during which the uterus is functionally at rest so far as menstruation is concerned. As the result of afferent nerve impulses, awakened or increased muscular action of the involuntary uterine fibres occurs; this also aids in determining the congestion which results in the breaking-down of vessels.

Professor Stephenson has shown that menstrual life is associated with a well-marked wave of vital energy, which manifests itself in a monthly fluctuation of the temperature of the body, of the daily amount of the excretion of urea, and carbonic acid and of the rate and tension of the pulse. The wave attains its maximum during the week preceding menstruation, and slowly falls to its minimum, which is reached the week after menstruation. This wave indicates a periodic variation in the bodily metabolism, and is probably directly influenced by the rhythmical activity of the menstrual centre. This observation would seem to be nullified by the fact that the phenomena referred to were found by him to occur in men as well as in women, and that the lower animals also seemed to show the same periodic variations. He writes: "It is, therefore, evident that the phenomena belong not to the function of menstruation but to a general law of vital energy."

A. W. Johnstone observes that "the close of the nineteenth century will see the emancipation of the uterus from the thralldom of the ovary. For generations it has been taught that the ovary was the centre around which the woman revolved, and that the uterus was a mere appendage to it. Now, however, we know that they are independent organs, each having a separate nerve control which centres back in the sympathetic plexus and the spinal cord. The greatest discovery which the century has seen is that of Stephenson's law. Without it to-day the physiology of the productive organs would be in an inextricable tangle. It marks the same era for gynecology that Harvey's discovery of the circulation of the blood did for general surgery."

Menstruation may then be defined as the periodical discharge of blood from the uterus, accompanied by the shedding of the epithelium of the body and fundus, as well as that of the utricular glands near their orifices. The sanguineous discharge is due partly to the oozing of blood from the surfaces denuded of epithelium and partly to active congestion. The discharge from the uterus is largely augmented by mucus secreted in increased quantity at this period from the enlarged utricular glands. The tubes take some part in the process of menstruation. Their mucous membrane is swollen, the epithelium is shed in places, and they are filled with a thin bloody fluid containing blood corpuscles and cast-off epithelial cells. The menstrual wave continues from puberty to the menopause. It is a nervous phenomenon.

Ovulation is a progressive non-periodic process. It begins before birth and continues till the ovarian tissue is atrophied or worn out.

The Menopause. The average duration of the menstrual function is from thirty to thirty-two years. Raciborski estimated the duration of menstrual life at about thirty-one years and nine months. According to him the mean age of puberty at Paris was fourteen years and seven months; therefore the average age of the menopause was forty-six and one-half years. Tilt gives the average age of cessation of menstruation in 1082 cases as forty-five years and nine months. The average age is between forty-five and fifty years. It has been shown by Krieger, Kisch and others that the earlier the menses appear the later they cease, and *vice versa.* However, when the first period is unusually early or late

the menopause comes very early ; also, that the sexual function is usually abolished earlier in the laboring class, who are compelled to work hard and who have many cares, than in the well-to-do and rich.

Race does unquestionably influence the duration; but given a sound, healthy race, which is not too much enervated with civilization and the menstrual process, will equally with the total and physical vigor and vitality be increased. At the present day there is an increased sexual vitality, which shows itself in the fact that the duration of menstrual life has been increased three or four years during the past generation. The inference can be fairly deduced that vigorous vitality causes prolongation of the menstrual process and the actual age. Robinson believes that a prolonged menstrual life depends on a largely developed solar and hypogastric plexus, which indicate a large blood supply as well.

By the menopause is understood the whole period from the beginning irregularities in the time of appearance of the menstrual flow until its actual cessation. The average duration of the menopause is two and a half to three years.

The menopause is a physiological and conservative process. It occurs at a time of life when all the tissues are most stable and the nutrition of the body at its best. Other physiological changes which occur at the same time are decrease in size of the spleen and lymphatic glands. Peyer's patches smooth down and lose their peculiar structure, the intestinal villi shrink and become less vascular, the muscular coats of the intestine atrophy, and lessened peristalsis ensues. These are not the degenerations of age, but the blood-supplying, blood-making, and blood-elaborating organs of the body have completed the growth of the organism, done their work, and are striking a balance with the needs of the economy.

The object of each metamorphic or developmental epoch is a critical readjustment of the organism, in order to ensure the greatest possible amount of health for each subsequent period of life. In the vast majority of cases this object is quietly effected, but sometimes the constitution only rallies after having been severely shaken for a varying period.

General Phenomena of the Menopause. Börner states that while many women pass this period without noting any change in their

BOSTON MEDICAL
MAR 14 1919
ANNA M. GALBRAITH
LIBRARY

former condition, and are conscious of the occurrence of the change of life only by reason of the absence of the menstrual flow, others suffer for years with a host of troubles.

One of the most essential changes is that of the woman's psychical condition—from slight vagaries, loss of interest in the daily affairs of life, to melancholia and insanity.

"Two factors are generally taken into account: First, the sudden cessation of the menses; second, the reflections of the patient, caused by her condition, meditations on the loss of youth and sexual power, and anxiety in view of the dangers of the climacteric. It cannot be denied that there is some truth in the supposed sad thoughts about the beginning of old age, and the depression caused by them can scarcely be considered abnormal."[1]

Napier believes it is extremely rare for the cessation to occur without some physical discomfort or some disturbance of the nervous system, but adds that "some women, however, cease menstruating with very slight inconvenience." As a rule, the woman misses one, two, or more periods, then a menstruation of almost normal quantity and duration, and this is again repeated at gradually longer intervals and with a diminished flow until actual cessation occurs.

The periods cease, owing to the degeneration and disappearance of the glandular tissues of the uterus, and secondarily to similar changes in the ovaries and other glands. This is followed by an involution or atrophy of all the structures of the genitalia.

An increase in the size of the uterus, from increase in the amount of blood, is frequently noticed at the beginning of the menopause. Later it becomes smaller in all its dimensions. The wall becomes thinner, the os internum smaller, and is often even obliterated. The cervix becomes shorter and thinner, sometimes hard, sometimes flabby, as a membrane. But the distinguishing feature of the menopaustic uterus is atrophy of the endometrium. The large bundles of tissues are lacking, the whole membrane is thinned and wasted, the fibrillated structure is disappearing, the corpuscles are few, and the utricular glands are lessened in size and number.

In consequence of the removal of these features of peripheral irritation the nerve centres cease to receive afferent stimulation,

[1] Börner.

and after a given period, longer or shorter, and attended with more or less functional disturbance, cease to functionate.

The changes in the uterus and Fallopian tubes are earlier than those in the ovaries, so that ovulation, though lessened in activity, may persist for a considerable time after menstruation has ceased. Ovarian atrophy has been referred to senile rather than menopaustic changes.

Atrophy of the ovaries occurs very gradually. Puech found in one case that the ovaries were of normal size three years after the establishment of the menopause. Kiwisch describes the structural change in this gland as consisting on the one hand of an increase of the connective tissue stroma from the periphery toward the centre, the gradual hypertrophy of which results in the destruction of the epithelial elements, and, on the other hand, the Graafian vesicles themselves undergo retrograde change. In consequence of these microscopical changes which take place very slowly the entire organ becomes harder and smaller.

Napier believes that the ovaries secrete certain specialized substances which aid in determining menstruation. And that in a less degree the utricular glands and the glands of the Fallopian tubes share in this action. He considers that this is probably secondary to the chain of peripheral irritation from the uterine glands and the resulting afferent nerve impulses and efferent nerve currents, but that this secretion is not the less an essential feature of the menstrual process.

In support of this view he calls attention to the pigmentation of the skin which occurs during pregnancy and chlorosis, showing that the absence of the catamenia results in the retention in the blood of some substance which would normally be excreted at this time.

Other atrophic changes of the genitalia are shrivelling of the vulva, with prolapse of the vagina or uterus, from relaxation of the ligaments, and loss of the natural support afforded by the changed perineal body.

Uterine catarrh occurs almost invariably, and only ceases in advanced years. Displacements of all kinds are frequent; but on account of the now greatly diminished weight of the uterus these are insignificant.

The vagina is at first almost always hyperæmic. This disappears as the vessels successively atrophy, but it takes place much

sooner in some spots than others, hence the characteristic appearance of dark-red spots on a pale ground. The vagina gradually becomes narrower and shorter. The mucous membrane loses its rugæ and presents a pale, grayish, blanched hue.

The researches of Byron Robinson,[1] made by the dissection of a number of old women, show that after the menopause not only is there an atrophy of the genital organs, but the hypogastric plexus also shrinks away. "It becomes smaller and firmer, and no doubt some strands disappear. On this fact must be based the pathological symptoms accompanying the cessation of the menstrual function. In dissecting infants which have lain in alcohol for some six weeks the opposite condition of the hypogastric plexus may be observed, for in the young child the hypogastric plexus is disproportionately larger and can be very plainly dissected out."

The importance of the genital organs is shown by the vast nerve supply sent to them, and also because the hypogastric originates in great central sources: the solar and renal plexus and the lateral chain of the sympathetic. When this great nerve tract becomes atrophied so that it can no longer transmit the higher physiological orders all parts of the sympathetic system must be unbalanced, until a new line, the next line of least resistance, is established. And Robinson believes that this is the explanation of the many pathological manifestations of every viscus at the menopause—that is, "the irritation which arises by trying to pass more nervous impulses over plexuses than normal gives origin to what is unfortunately known as functional disease. It is just as organic as any disease, only we are unable to detect it."

Chemical changes in the blood and tissues are constant vital phenomena. Increased oxidation causes increased activity of the circulation, increase of temperature, increase of urea and carbonic acid in the economy, from the retrograde changes, and, finally, during menstrual life, the flow of blood from the uterus carries off the effete materials from the highly charged system.

The elimination of albuminoids, as shown by the altered condition of the blood after menstruation, is greater than can be accounted for by the blood discharged. When the menopause is

[1] American Medical Association, Chicago, 1894, xxiii. pp. 345–351.

attained suddenly the retention of such albuminoid substances must act toxically. Hence the resulting clinical fact that sudden cessation of the menses is in the majority of cases attended with pronounced symptoms of discomfort, and it is in these cases that untoward results are most likely.

James Oliver believes that the catamenial flow eliminates from the body those substances whose presence in the blood would exert a deleterious influence on the animal economy.

The Prominent Symptoms of the Menopause. Christopher Martin holds that the symptoms of the change of life are produced largely by a condition of instability and increased excitability of certain other cerebro-spinal centres, directly brought about by failure of the menstrual centre, and adds: "It is probable that the ovaries, like the liver and thyroid gland, modify the blood circulating through them, and add to the blood some peculiar product of their metabolism. It may be that some of the climacteric symptoms are due to the loss of this substance from the system." [1]

Arthur Johnstone's theory of the symptoms of the menopause is that the endometrium atrophies and becomes old cicatricial tissue, and, like all other adenoid structures, it sinks into quiet decay. The nervous system begins to readjust itself, but no longer having free outlet through the soft lymphoid tissues of the uterus, the wave pressure meets with resistance, and a choppy sea results. Vertigoes, bilious attacks, etc., are nothing more than reflex waves. The weakest organ of the individual is the one that generally suffers. And that the kidneys, which all along have borne the brunt of life, should now show positive signs of Bright's disease is natural.

The etiology and pathology of the menopause lie in the sympathetic or ganglionic nervous system. And it is by breaking up the harmony of previous processes that nervous disturbances are produced.

After the cessation of the flow over 8 per cent. of women suffer from "flashes," which are caused by the irritation of the heart and vasomotor centres. The bloodvessels of the head and neck seem to be most affected, yet the skin of the whole body shares in the disturbance. The nerve impulse which should be emitted along the hypogastric plexus is abnormally forced along other plexuses,

[1] British Gynecological Journal, 1893, vol. ix. p. 271.

and the vasomotor centre becomes irritated, resulting in the dilatation and contraction of the peripheral vessels. All molecular action generates heat, and it may be that much of the heat experienced may be due to the rapid dilatation of the vast number of vessels and the rapid flow of fresh blood in them. Besides the vasomotor and heat centres being disturbed, the sweat centre is irritated. The flushes and flashes are followed by various degrees of sweating, which varies from a slight moisture to great drops.

Nervous irritability is a prominent symptom in 8 per cent. of women at the time of the menopause. Most of the pain arises around the stomach—that is, the solar plexus. Digestive disturbances are very common at this time.

The effects on the individual viscera can readily be understood by noting how the irritation can pass up the hypogastric plexus to the solar plexus, and, being reorganized, be transmitted to the digestive tract. When the irritation reaches the digestive canal by way of the gastric, superior and inferior mesenteric plexuses, it first affects Auerbach's ganglionic plexus of nerves, which lies between the muscular layers of the gut wall. This simply disturbs peristalsis, and may produce some colic. But as irritation passes on to Meissner's plexus it disorders secretion, which is controlled by this centre. Irritation of Meissner's ganglia may produce excessive secretion, diarrhœa, or deficient secretion, constipation, or disproportionate secretion, fermentation. Disturbances of the liver are caused by the irritation passing from the solar plexus to the liver, inducing excessive, deficient, or disproportionate secretions of bile, glycogen, or urea.

Tilt holds the view that the too strong reaction of the sexual organs on the central ganglia is their principal cause of disease. Puberty, menstruation, pregnancy, lactation, or the menopause almost always entail some derangement of the ganglionic system which is sometimes sufficiently severe to lead to insanity and suicide. Debility underlies all ganglionic affections, in the same way as nervous irritability underlies all cerebral diseases. Sometimes there is an overpowering sense of exhaustion pervading the whole system.

Forms of climacteric insanity are delirium, mania, hypochondriasis, melancholia, irresponsible impulses, and the perversion of moral instincts.

" If the reproduction apparatus does not act on the brain by

the instrumentality of the circulating organs of the blood, it must do so by means of the nerves. The genital apparatus is richly endowed with ganglionic nerves, and I have shown how frequently evident signs of disturbance in the ganglionic centres coincided or alternated with headaches, nervousness, hysteria, and epilepsy. What wonder, then, if the same powerful influence of the sexual organs, through the instrumentality of the ganglionic nervous system, should at times produce a permanent derangement of the mental and moral faculties. I am thus led to look on the ganglionic nervous centre as a source of vital power producing reflex morbid phenomena in accordance with variable cerebral predisposition" (Tilt).

Another very frequent symptom of the menopause is *tachycardia.* It may be caused by the condition of the blood, whether it be impoverished—anæmia—or too rich in red globules or fibrin, or by reflex irritation of the pneumogastric or sympathetic nerves, by overexertion, or by alcoholism.

Clement believes that the tachycardia of the menopause is due to general debility; the woman resists fatigue less easily, and she experiences a general malaise. To the palpitations are rapidly added syncope, distress, and shortness of breath. The sleep is troubled with præcordial distress.

Baldwin says that women in whom the menopause occurs early are more liable to tachycardia than those who menstruate until later in life, and that it occurs with especial frequency when the menopause has been prematurely induced by surgical operation or by disease.

Kisch concludes that tachycardia is due to the hyperplasia of the stroma of the sexual organs, and says that this increase in connective tissue fibres acts in some unknown way upon the terminal fibres of the sympathetic.

Baldwin suggests that it is equally probable that tachycardia may be due to the formation of scar tissue at the seat of a cervical laceration, especially as it has sometimes been promptly and permanently cured by removing the cicatricial tissue and suturing the wound.

Nothnagel, who has studied this subject with great care, stated that whatever the cause may be it acts in some cases by stimulating the sympathetic and in others by producing a transitory paralysis of the inhibitory fibres of the pneumogastric.

Perhaps the most alarming symptom of the menopause is hemorrhage. It may be due to general or local causes. Among the general causes are cardiac, pulmonary, splenic, and renal diseases. Local causes of hemorrhage are endometritis, chronic pelvic inflammations, faulty uterine positions, erosions and ulcerations of the os, glandular polypi, fibroid tumors, and cancer. All competent observers agree that cancer in women is much commoner from forty to fifty years than at any other age.

Hemorrhages occupy the foremost place among the pathological phenomena of the genital tract during the menopause. Scanzoni thinks that in many instances they are due to the senile rigidity and friability of the uterine vessels, which are not in a condition to offer sufficient resistance to the blood-pressure which is brought to bear on their walls. According to Kisch, the hemorrhages of the menopause are due to softening and relaxation of the uterine tissue. Additional causes are found in the circulatory disturbances in the pelvic organs, and obstruction of the vena cava inferior, whereby the outflow of blood from the pelvic vessels is hindered and a chronic stasis in the uterine walls is produced. The same author in another place quotes from Peter Frank, who attributes it to early and profuse menstruation, frequent and difficult labors, frequent abortions and excess in drinking.

In many cases the hemorrhages seem to be the expression of vasomotor disturbances, such as those in other regions which frequently characterize the menopause. The third and last variety include those cases which may be referred to some disease of the pelvic organs themselves.

Anatomical changes may lead up to pathological conditions. A chief feature characteristic of uterine disease is malnutrition from atrophy—a sudden curtailing of the blood-supply from the degeneration of the genital nerve apparatus, and consequent impaired vitality of tissue from defective nourishment. Ulcerative surfaces, local death, and purulent secretions arise from low granular cell formations. The anatomical changes in the glands and substance of the uterus also favor the irritation or the development of malignant and benign neoplasms—*e. g.*, cancers, fibromyomata, etc. A most annoying and obstinate symptom is pruritus.

Glycosuria of the menopause is likely to attract attention first through an obstinate form of pruritus vulvæ. Eckhard contends that the phenomena of glycosuria are irritative rather than par-

alytic. Be that as it may, hyperæmia of the liver is the result by which sugar is thrown into the system and eliminated by the kidneys. Cary has advanced a chemical theory to explain the action of hyperæmia in producing glycosuria. He considers that in healthy digestion the carbohydrates—starches and sugars—are converted not into glucose but into maltose, which is absorbed and assimilated and converted into glycogen. For the proper production of maltose and its assimilation, a good venous blood, producing a maltose-forming ferment, is necessary. When hyperæmia of the chylopoetic viscera exists, the blood reaches the liver too little deoxygenated, and a glucose-forming ferment is produced. The glucose not being assimilable, passes off into the circulation, and is excreted by the kidneys. It is quite possible that this is due to the altered circulatory conditions of the menopause.

The last pathological condition which we will mention is kidney disease.

Le Gendre believes that the menopause exerts a deleterious effect on the kidneys—whether this be a congestion followed by a diminution in the quantity of the urine, or a sort of auto-intoxication due to the retention of a poison in the system that has been prevented from leaving by the ordinary path, and that this is especially so in women of a neuro-arthritic diathesis.

Armstrong says that in almost all cases at the time of the menopause the amount of urine passed is below normal, that the specific gravity is increased, and that the urine contains urates and almost always uric acid in excess. Further, that the functions of digestion and assimilation and the various metabolic changes are so largely under the control of the nerve centres that nothing seems more likely than that so great a disturbance of that system as takes place at the menopause should cause secondary derangement of these most important functions. That being so, the blood becomes loaded with waste products, and the usual symptoms follow —gout, etc.

Having considered the etiology of menstruation ; the physical changes which occur at the time of the menopause, together with the resulting symptoms, and certain pathological conditions which may arise, there remains only to consider what measures may be taken in order to prevent a physiological process from passing into a pathological condition, or, in other words, *are the dangers of the menopause natural or acquired?*

Tilt has reached the conclusion that "The best way to avoid the dangers of this critical time is to meet its approach with a healthy constitution. A marked want of strength prevents the regular succession of the vital phenomena by which all critical periods are carried on. And as the change of life is marked by debility, when this is grafted on constitutional weakness, loss of power will be of long duration. All complaints remain chronic, because there is not stamina enough to carry them through their stages."

Dusourd, whose practice lay in an agricultural district in the south of France, as well as Tilt, believes that peasant women suffer little at this period. Their health is generally good when the menopause comes on, and they are little liable to nervous disorders. The poor of large towns suffer much at this epoch—the necessity of working hard, the anxieties of poverty, and their unhygienic surroundings—but by a fortunate compensation the necessity for working hard prevents or cures the nervous affections which so often assail the rich at this period.

Tilt's cases showed that women who suffered much at the menopause had previously suffered at puberty and at the menstrual periods. Among thirty-nine cases where there was no suffering at the menopause there was the same immunity from suffering at puberty and at the menstrual epochs.

In forty-four cases of my own, all women past the menopause, the age of the first menstruation was as follows:

One	at 10	years,	Eight	at 15	years,
One	" 11	"	Five	" 16	"
Three	" 12	"	Three	" 17	"
Eight	" 13	"	One	" 18	"
Thirteen	" 14	"	One	" 21	"

making the average age of the first menstruation fourteen years and four months.

In a list of forty-nine cases the age of the actual cessation of the menstrual flow was:

Three	at 40	years,	Five	at 48	years,
One	" 41	"	Four	" 49	"
One	" 42	"	Six	" 50	"
Two	" 44	"	Five	" 51	"
Five	" 45	"	Four	" 52	"
Three	" 46	"	Six	" 53	"
Two	" 47	"	Two	" 55	"

making the average age of the actual cessation of menstruation at forty-eight years and five and two-thirds months. Subtracting from this the average age of the first menstruation, fourteen years and four months, we have as the mean age of menstrual life thirty-four years and one and two-third months—that is, the average duration of the menstrual function was from two to four years longer than that usually given.

A further investigation, in order to ascertain any possible relation between the age of marriage and the number of pregnancies to the sufferings of the menopause, elicited the following statistics. In a list of thirty-nine cases the age of marriage was :

One	at 16	years,	One	at 27	years,
One	" 17	"	Three	" 28	"
Two	" 18	"	Two	" 30	"
One	" 19	"	One	" 31	"
Two	" 20	"	Two	" 32	"
Three	" 21	"	One	" 35	"
Seven	" 22	"	One	" 38	"
One	" 23	"	One	" 42	"
Three	" 24	"	One	" 46	"
Four	" 26	"	One	" 47	"

making the average age of marriage twenty-five years and ten months.

In a list of forty-eight married women, of the four who were married after thirty-eight years, all were sterile ; of the remainder,

Six,	each gave	birth to	1	child.
Eleven,	"	"	2	children.
Eight,	"	"	3	"
Five,	"	"	4	"
Seven,	"	"	5	"
Four,	"	"	6	"
One,	"	"	7	"
One,	"	"	9	"
One,	"	"	10	"

giving an average of slightly above three children each.

The number of miscarriages in the same list of forty-eight women was as follows :

Twenty-nine	had	no miscarriages.		
Fifteen	"	each	1	miscarriage.
One	"	"	2	"
One	"	"	3	"
One	"	"	4	"
One	"	"	7	"

That is, 40 per cent. of all these patients had one or more miscarriages.

In a list of forty-two cases, nine had habitually suffered from severe dysmenorrhœa, eleven had slight dysmenorrhœa, and twenty-two never had felt the slightest inconvenience.

In a list of fifty-two cases, all of whom had passed the menopause, five were perfectly healthy and had never suffered the slightest inconvenience. One of these was single, and only one had had one miscarriage. Ten had suffered at the time of the menopause from slight malaise, but not sufficiently to call in a medical attendant. Thirty-seven were more or less seriously ill; thirty of these needed local as well as constitutional treatment, and seven constitutional treatment only.

The prominent symptoms of the climacteric in a list of fifty-two cases were as follows:

Marked debility	24	Indigestion	32
Intense nervousness	31	Constipation	28
Neurasthenia	9	Diarrhœa	3
Melancholia	10	Leucorrhœa	38
Headache	14	Rheumatism	21
Neuralgia	6	Gout	1
Hysteria	7	Bright's disease	12
Irritable heart	11	Hemorrhage	6
Tachycardia	6	Alcoholism	2
Insomnia	19	Corpulency	2

As a result of the study of these cases the most striking feature was the relation of miscarriages to the sufferings and ill health at the time of the menopause. Of the nineteen women who had miscarriages, only one did not suffer in some way at the time of the menopause. Four suffered only slightly, and fourteen suffered extremely, not only during the menopause but in the post-climacteric period as well. And, secondly, that the prominent symptoms of the menopause are pre-eminently reflex, manifesting themselves in the functional diseases of the nervous system.

Tilt believes that single women suffer less than other women at the time of the menopause. He writes further: "As at puberty, from the ignorance in which it is still thought right to leave young women, so at the change of life women often suffer from ignorance of what may occur or from exaggerated notions of the perils that await them. It would be well if they were made to understand

that if in tolerable health, provided they will conform to judicious rules, they have only blessings to expect from the change of life. Most unfortunately, the individual not cognizant of the invisible changes going on in the economy does not adapt the mode of life to the new conditions of the organism, and the weakened and lessened amount of the digestive fluids are unable to master the large quantities of food. The absorbents refuse to take more than is needed to repair the tissues. The atrophying muscles of the digestive tube, unable to hurry on the mixed products of indigestion, fermentation, and micro-organisms, inciting fermentations and elaborating toxic alkaloids, poison and disorder the functions of life. Man's out-door life enables him to escape many of these evils."

Woman's enervating mode of life, the continued introspection, coupled with the peculiar changes in the nutrition of the body at this time, renders the nervous system peculiarly impressionable and liable to the manifold forms of diseases. While "the woman is told that she must be patient and calm, and that time, the tomb builder, will alleviate all her sufferings," this critical period may be dangerous to those who are always ailing, for habitual sufferers at the menstrual periods, and for those affected with uterine diseases. If on the first indication of the change of life women who are in fair health carefully followed a regimen and pursued a line of life in harmony with the physiological processes on which this change depends, disease would be prevented. But as the change concerns a natural function, it is left to nature; no additional precautions are taken, and advice is only sought when the mischief is done.

It is not wise to marry during this period. On the first appearances of the irregularities of the menopause the amount of food and stimulants to which women have been accustomed should be curtailed rather than augmented. The system requires supporting by medicine and regimen—rather than stimulating by spirits—baths, mental and moral hygiene, and occupation.

From the foregoing physiological study we have seen that according to the plethoric theory which prevailed until 1835, and to the nerve theory, which is based on the latest anatomical and physiological researches, that menstruation is a physiological process to get rid of the effete material, and is therefore an excretion.

At the end of perhaps thirty years, by a conservative process of

nature, the child-bearing period ceases, and the organism is re-adjusted to the end that the woman's vitality may all be conserved for her own individual life.

Each metamorphic or developmental period of life, dentition, puberty, and the menopause, throws a special strain on the nervous system, and the recent studies of the sympathetic system at the time of the menopause show that very extensive anatomical changes occur at this time. That being the case, the woman must lead such a life as will ensure her having on hand a large reserve force necessary to meet these heavy demands. Tilt's observations show that women who have experienced no suffering at puberty or at the menstrual periods do not suffer at the menopause. It is, therefore, evident that the time to begin this preparation is in childhood.[1]

That single women suffer less than married women would suggest the occurrence of lesions as the results of pregnancies, many of which lesions could have been prevented or cured by the timely aid of the physician.

That the most frequent and serious disturbances are those of the nervous system, and that from their mode of life and habits of introspection the rich suffer more from these ailments than the poor, must cause serious consideration of the physiological necessity for a definite occupation for the daughters as well as for the sons of the rich.

The frequency with which Bright's disease is found at the time of the menopause is dependent not so much on the local physiological changes which are taking place as on the time of life. Loomis says it was not until life insurance examinations became so common that the frequency with which kidney disease existed in persons who believed themselves well was even imagined. And as the result of his observations in these cases, and of a large number of autopsies conducted at the Bellevue, he stated that it is his belief that 90 per cent. of men and women over forty years of age suffer from some form of Bright's disease. That being the case, it would seem that after this period of life at least as much attention should be directed to the kidneys as to the teeth, and a semi-annual examination of the urine should be made.

The recently acquired knowledge of the therapeutic action of

[1] Galbraith, Anna M.: "Hygiene and Physical Culture for Women."

the thyroid and other gland extracts favors the belief of a special gland secretion which would suggest that gland extracts given in certain morbific conditions would aid in restoring what is lacking in the system until the economy has become accustomed to effect the necessary metabolism independently. Fosberg advises for vasomotor disturbances, flushings, etc., five grains palatinoids of ovarian gland.

If gynecologists should watch women as carefully through the menopause as obstetricians now watch women through pregnancy, the obvious conclusion of the above study is that in the majority of cases the dangers attending the menopause might have been avoided, and even arrived at this age women would be prepared to enjoy a healthy and useful post-climacteric period of life.

128 West Seventy-first Street.

Recent Literature.

Aldrich, Charles J., M.D. "Rôle Played by Intestinal Fermentation in the Production of the Neuroses of the Menopause," Phys. and Surg., Detroit and Ann Arbor, vol. xix., 1897.

Armstrong, William, M.R C.S. "The Latent Gout of the Menopause," Med. Press and Circ., London, lxiii., 1897.

Baldwin, Frank, M.D. "Tachycardia at the Menopause," Brooklyn Med. Jour., ix., 1895.

Bloom, Homer C., M.D. "Physiological and Surgical Menopause Compared," University Med. Mag.. Philadelphia, viii., 1895-96.

Börner, Ernest, M.D. "The Menopause," Cyclopædia Obstet. and Gynec., xi., 1887.

Charrin. "La Chlorose," Gaz. hebdom. de Méd. et de Chir., 1896.

Clement, E., M.D. "Cardiopathie de la Ménopause," Lyon Médicale, xlvi., 1884.

Collins, E. Tennyson. "Nervous Impulses Controlling Menstruation and Uterine Hemorrhage," Brit. Med. Jour., i., 1895.

Fosberg, W. Hubert S., M.A., M.D. "Severe Climacteric Flushings Successfully Treated by Ovarian Extract," Brit. Med. Jour., London, i., 1897.

Galbraith, Anna M., M.D. "Hygiene and Physical Culture for Women," New York, 1895.

Hunter, James B., M.D. "The Menopause in Some of its Relations to Disease," Med. Record, New York, 1888, 571.

Jacobi, Mary Putnam, M.D. "The Question of Rest for Women During Menstruation," New York, 1877.

Jaggard, W. W., M.D. "Functional Disorders in Connection with the Menopause," Pract. Med., Pepper, iv., 1896.

Johnstone, Arthur W., M.D. "The Menstrual Organ," Brit. Gynec. Jour., ii., 1886.

Johnstone, Arthur W., M.D. "Menopause: Natural and Artificial," New York Jour. Gynec. and Obstet., iv., 1894.

Johnstone, Arthur W., M.D. "Comparative Zoölogy of Menstruation," Cincin. Lancet, Clinic., xxxix., 1897.

Kieffer, J. H. "La Fonction Glandulaire de l'Uterus," Archiv. de Physiol., A., 1897.

Kisch, E. H. "Die Herzbeschwerden Klimaterischer Frauen," Berl. klin. Wochenschr., xxvi., 1889.

Kisch, E. H. "Ueber Tachycardia zur Zeit der Menopause," Prag. med. Wochenschr., xvi., 1891.

Le Gendre, P. "La Ménopause et le Rein," Bull. et Mém. Soc. Méd. d'hôp. de Paris, iv., 1897.

Martin, Christopher, M.B. Edin., F.R.C.S. "The Nerve Theory of Menstruation," Brit. Gynec. Jour., ix., 1893.

Napier, Leith, M.D., F.R.S.E. "Notes on the Administration of Animal Extracts and Allied Substances During the Menopause," Brit. Gynec. Jour., vii., 1896.

Napier, A. D. Leith, M.D., F.R.C.S. "The Menopause and its Disorders," London, 1897.
Oliver, James, M.B., F.R.S. Edin. "Menstruation—its Nerve Origin—not a Shedding of Mucous Membrane," Jour. Anat. and Physiol., xxi., 1887.
Petit, A. "Sur le rein dans la ménopause," Bull. et Mem. Soc. Méd. d'hôp. de Paris, iii., 1897.
Quain. "Elements of Anatomy," iii., 1895.
Retterer, E. "Sur la Modification de la Muquese uterine à l'époque du rut," Compt. rend. Soc. de Biol., Paris, ix., 1892.
Robinson, Byron, M.D. "The Menopause," Amer. Med. Ass., Chicago, xxiii., 1894.
Savage, G. H. "Some Mental Disorders Associated with the Menopause," Lancet, London, ii., 1893.
Savage, G. H. "Some Neuroses of the Climacteric," Tr. M. Soc., London. xvii., 1894.
Shepherd, George R., M.D. "Climacteric Glycosuria," Proc. Con. Med. Soc., iii., Hartford, 1887.
Sutton, J. Bland, F.R.C.S. "Menstruation in Monkeys," Brit. Gynec. Jour., ii., 1886.
Tait, Lawson, F.R.C.S., LL.D. "Climacteric Diabetes in Women," Practitioner, xxxvi., 1886.
Tilt, Edward John, M.D. "The Change of Life in Health and Disease. A Clinical Treatise on the Diseases of the Ganglionic Nervous System, Incidental to Women at the Decline of Life," Philadelphia, 1882.

Pupillary Phenomena in Some General Diseases.

By JEANNIE S. ADAMS, M.D.,
OPHTHALMOLOGIST TO THE WOMAN'S DEPARTMENT OF THE NORRISTOWN HOSPITAL FOR THE INSANE.

In preparing this paper I have purposely left out of consideration most disputed points, since eminent authorities hold markedly diverse opinions. It seemed to me that the technical points involved would be of less interest to an audience composed of specialists in such widely different branches of medicine as are here present, than the consideration of more practical points.

The pupils in health vary greatly in size and mobility in different individuals and at different stages of life. The pupils in infancy are small, increasing in size through childhood to adult life and becoming gradually smaller as old age advances. They are usually smaller in persons with blue or light-colored irides than in the more darkly pigmented eyes, due to the increased amount of light admitted through the paler-colored iris. In health the pupils are round in shape and react rapidly to light, accommodation, and convergence, and certain mechanical stimuli, such as tickling the palms of the hands, pinching the skin of the neck, or applying electrical currents. The emotions also influence the size of the pupils, and they dilate widely under the stimulus of

fear or pain, etc. They are larger in the dark than in the light; larger when looking at distant objects, smaller when looking at near objects.

The changes produced by disease affect (1) the size; (2) the shape; (3) the motility.

SIZE. The pupils may vary in size in two ways. They may be larger than normal, called mydriasis, or they may be smaller than normal, called miosis. The pupils may vary in shape regularly, as when one or both are oval, ovoid, or slightly triangular, or irregularly, as when they are crenate or scalloped from adhesions of the iris.

MOTILITY. The pupils may vary from the normal reaction (1) to light, either directly or indirectly; (2) to stimulation applied to different parts of the body; (3) to accommodation and convergence.

The usual method of examining a pupil is to place the patient opposite a window where bright diffuse daylight is obtainable. The patient is then directed to look at a distant object, and one eye is covered while the other is being observed. A card or the hand is then interposed between the light and uncovered eye. The pupil when shaded becomes larger, and contracts quickly when the card is removed and the light strikes it. This is the normal light reflex. If the pupil in the covered eye is seen to dilate or contract with the changes in light and shade falling on the uncovered eye, the consensual or indirect light reflex is normal. If there is no reaction to diffuse daylight the pupil may still react in the dark room with the light from an ophthalmoscopic mirror, and such a test should be made before a conclusive statement concerning the light reflexes is given. At times the pupils, instead of reacting promptly to light and then dilating, show a peculiar to-and-fro oscillation, first contracting and then dilating for some seconds before remaining quiet. This is called hippus, and has been noted in a marked degree in hysteria, epilepsy, and insanity.

In testing the reaction to accommodation and convergence, the patient is directed to look at a distant object, and then, one eye being covered, a small object is held closely in front of the other, and the patient told to look at it. The pupil should react promptly, becoming smaller.

To the statement accepted by the vast majority of ophthalmologists, that the pupils in health are equal in size in both eyes,

there are few writers who have taken exception, but these are of sufficient importance to mention. Iwanow,[1] out of 134 young recruits stated to be healthy, found only 12 with equal width of pupils, 49 being larger on the right side and 73 on the left side. Reber,[2] in 50 cases of young recruits, found 7 cases, or 14 per cent., of manifest difference in size. This was increased by examination under feeble illumination when latent inequalities were manifested. The difference in size is rarely very great, and can easily be overlooked. It may be that further and more careful investigations may show unequal widths to be normal in some individuals, as we may consider a greater development of the right side of the body a normal condition, due to the greater use of that side. Inequality of the pupils, however, has been found in so many serious diseases, that any such occurrence should be carefully noted, and the case studied, lest the sign of the commencement of a grave condition be overlooked, an incorrect prognosis given, and precious time lost by not starting a correct line of treatment. It seems to me, that though recruits are subjected to a careful examination before being admitted to service, and are considered fine specimens of manhood, yet with an incomplete knowledge of their inheritance and future development in health and disease, it is dangerous to consider their pupillary inequality a normal condition, and, where such a condition is observed among our personal patients, in justice to them every cause giving rise to inequality should be considered.

Pupillary inequality is found in high grades of different refractive conditions, as where one eye is near-sighted while the other is far-sighted. It is also found in aneurism, dental disease, and in diseases of the nervous systems, as tabes, dementia, and disseminated sclerosis.

Hysteria may give rise to marvellous manifestations in the pupils, as well as in other parts and systems of the body. A case reported by Dr. Spiller, and which I had the opportunity to see at his clinic for nervous diseases at the Polyclinic Hospital, showed a dilated pupil on the right side immobile to light, though slightly reacting to accommodation. Later it became fixed, and did not react to light, accommodation, or convergence. The fields were contracted, and a reversal of the blue and red fields was

[1] Archives of Ophthalmology, vol. xvi.

[2] Medical News, August, 1895.

found in the left eye—*i. e.*, the one with the smaller pupil. On the right, where the marked mydriasis was found, the fields were so contracted that colors were only detected at the fixation point. Suggestion, associated with a plain glass which did not affect vision in that eye, gave reaction to light and accommodation transiently.

Dr. Harlan[1] has reported a case where the pupil of the right eye was at first dilated and reacted imperfectly to light, while later the vision was lost, blepharospasm developed, the pupil became widely dilated and fixed, and the muscular spasms extended to the neck. The pupil became movable, normal in size, and vision returned by the use of a wooden magnet with iron tips.

Tabes shows characteristic pupillary phenomena which are of great value in the diagnosis of the disease.

Berger[2] found in his case of tabes that nearly one-half had Argyll-Robertson pupils, while Gowers found reflex iridoplegia forty-eight times in seventy-two tabetic patients. Argyll-Robertson described a pupil in which the iris did not react to light, but did react to accommodation. This is also what is meant by reflex iridoplegia, the iris acting as if paralyzed when light is thrown upon it. The pupils are often unequal in size and irregular in shape. They may be dilated, though the usual form is a small miotic pupil, the so-called spinal miosis. Berger observed the mydriasis in many cases in connection with paralysis of accommodation as one of the earliest signs of tabes. He considers that the loss of reaction to light is only the commencement of the process which gradually involves the reaction to accommodation and convergence, and finally results in total paralysis of the iris. A trace of the reaction to light may be preserved for a long time, but is lost before the skin reflex.

The shape of the pupils is often slightly irregular, being oval or some variation from the usual round form, while the long axis is usually nearer the horizontal than the vertical axis. The irregular shape of the pupil is ascribed by Berger to a paralysis of the iris varying in different meridians, thus making a pupil longer in or near the horizontal axis.

The spinal miosis is transiently changed to mydriasis when the lancinating pain of the crises is felt.

[1] Transactions of the American Ophthalmological Society, 1884, p. 649.
[2] Knapp's Archives of Ophthalmology, 1890, vol. xix.

When the eye symptoms occur in the preataxic stage the progress of the disease is affected and its development checked. When they occur later in the disease, and the ataxia has been already developed, it is not influenced, though the pains become slightly less.

Rheumatism affects the pupil in a markedly inflammatory way, causing an iritis which often leaves a permanent change in shape. Rheumatic iritis is of the plastic type, and the iris becomes inflamed, the pupil miotic, and synechiæ develop from the contact of the lens and the posterior pupillary border. The onset may be so insidious and the pain so slight that the first thing noticed is the inequality of the pupils. This inequality of the pupils is most noticeable when not exposed to a strong light—*i. e.*, when the pupils are dilated. The iris affected, being held by one or more adhesions, dilates irregularly, or remains contracted. At times, however, the picture of a profound plastic iritis is present, with small immobile pupil, exudate in the pupillary space, hemorrhage, or even at times pus in the anterior chamber, the iris discolored and roughened, and a marked pericorneal zone of inflammation. A patient subject to rheumatism, complaining of pain in the eyes, should receive an immediate inspection of the pupil and treatment, as a timely instillation of atropia will not only often establish a diagnosis, but prevent damage or loss of eyesight, as the tissues are profoundly affected by the repeated inflammatory attacks.

The poisonous and systemic effect of drugs upon the pupil is well-known, especially that of morphine, cocaine, pilocarpine, chloroform and ether in the production of anæsthesia, atropine, or more frequently belladonna, when affecting the general system. The classic loss of sight with marked mydriasis from belladonna ointments or plasters was well illustrated last winter in a patient of mine, a woman who complained of sudden and complete loss of sight for near objects, and denied taking any medicines. There were no ocular lesions to account for the loss. I finally discovered that she was using belladonna plasters to stop the secretion of milk.

In tobacco and alcohol-poisoning the pupils are miotic at first. Lead-poisoning causes mydriasis, as also does quinine- and santonin-poisoning. In chloroform narcosis during the stage of excitability the pupil is usually widely dilated, but during narcosis becomes small, as in sleep, and continues thus throughout. If the narcosis

is not profound, irritation of the skin or loud sounds will cause temporary dilatation of the pupil, as also does vomiting. Should mydriasis occur suddenly without such causes, it is a sign of asphyxiation.

Syphilis presents many pupillary phenomena, both nervous and inflammatory. The inflammatory are divided into plastic and gummatous iritis.

The plastic iritis is found in secondary syphilis, and resembles the rheumatic form, but does not as a rule occur if the patient is properly treated. The adhesions formed are of wider extent than in rheumatism. The vessels of the iris being filled with blood, become straighter and the iris contracts, the pupil becoming small. This brings the edge of the iris in contact with the anterior capsule of the lens and, as the inflammation progresses, an exudate is thrown out, uniting the anterior capsule with the pupillary border of the iris, thus forming more or less strong adhesions. If atropine has been instilled the pupil may be found dilated ad maximum, but where synechiæ have already been formed it dilates unevenly and presents a scalloped irregular outline.

Gummata occur in the iris during the third stage, some authorities say during the second stage, and are situated usually near the pupillary edge. They appear as small, brownish-yellow or reddish-brown bodies, about the size of a small split pea. They are distinguished from suppurative nodules of exudate by being raised from an iris showing comparatively slight inflammatory change. The immobility of the pupil to light, with the surrounding inflammatory zone, the pericorneal bloodvessels, should lead to suspicion of deep-seated trouble and further investigation, as many cases are treated simply as a conjunctivitis, and thus come into the ophthalmologist's hands with extensive and often permanent adhesions.

The nervous affections of the pupil produced by syphilis are found in many distinctly differentiated diseases, as for example tabes and paretic dementia. When the nuclei of the optic and motor oculi nerves are diseased there are resultant ocular muscle changes, and the pupil is also affected. Uhthoff[1] describes a case of cerebral syphilis in which paralysis of the sphincter of the iris

[1] Berlin. klin. Wochenschrift, 1886.

and accommodation occurred with bilateral oculo-motor paralysis. Bilateral iridoplegia remained, with no reaction to light or convergence. From a study of the eye disturbances in one hundred cases of syphilis of the central nervous system, he shows that the reflex loss of reaction to light may be the remaining sign of an extensive paralysis of the third nerve. Smierling also reports a case of loss of reaction to light, without paralysis of the external muscles in one eye, but complete paralysis of the muscles supplied by the third nerve in the other eye.

Migraine ophthalmique, or recurring palsy, may occasion palsy of the internal muscles, which, however, gradually ceases.

Paretic dementia, or progressive paralysis of the insane, shows reflex iridoplegia with inequality of the pupils and irregularity in shape. There is loss of the reaction to light, and finally loss of accommodation. This is found in tabes, but otherwise is rare. Moeli found reflex iridoplegia in 47 per cent. of paretic dements, while other forms of insanity showed it only in 1.4 per cent. This makes an important point in diagnosis, and especially in prognosis, for paretic dementia is incurable, whereas some of the other forms of alienation may recover. The loss of reaction to light, or the irregularity in shape, may be the first symptom of paresis. Boediker mentions a patient who first had bilateral abducens paresis. One year later the pupillary reflex was lost, and four and one-half years later optic atrophy with diminished knee-jerk occurred. Two and a half years later the patient died.

The size of the pupils may be normal or dilated, but usually are small. The shape is also irregular. Galgo considers the irregularity in shape and action of the pupil more frequent than the inequality. The cutaneous reaction is often at first prolonged, the pupil remaining dilated long after the stimulation. Later the skin reflex is lost. It may be lost from the first.

Bevan Lewis,[1] in studying 147 cases, found only eleven which showed unilateral reflex iridoplegia. The Argyll-Robertson pupil is considered a bilateral iridoplegia by some authors. The importance of further study of pupillary phenomena is shown, since it has not been proved that unilateral loss of light reflex may not be part of the process which ends in the bilateral loss.

In cases of tumor or focal brain lesions the pupillary reactions

[1] British Medical Journal, April, 1896.

are of great localizing value. The pupil is under the influence of the sympathetic system and motor oculi nerves, and may vary in mobility and size in diseases of these systems. The reflex arc which controls the light reflex is through the retina and optic nerve, the chiasm, optic tracts, and corpora quadrigemina to the nucleus of the motor oculi nerve, and through this nerve and ciliary ganglion to the pupil. If the lesion or growth lies behind this reflex arc there may be complete blindness, and yet the pupil reacts to light. If the pupillary reflex is affected the lesion lies anterior to the primary optic centres. Hammond mentions a case where a tumor of the pineal gland pressed upon the corpora quadrigemina. There was complete blindness with dilatation of the pupil.

Wernicke's reaction is possibly the most important localizing symptom. It is that reaction of the pupil which occurs when the light is thrown from a small mirror upon the seeing half of the retina, and the pupil contracts, while, when the light is thrown upon the blind part of the retina the pupil does not react. The examination must be made in a dark room, and the reaction can easily be overlooked. Also, it may be transient, recurrent, or permanent, hence more than one examination should be made. Pressure on the thalamus and pulvinar cause it, also possibly pressure on the tract or destruction of the brachium anterior (Henschen).

Almost any pupillary phenomena may occur in insanity. Tabes, paretic dementia, epilepsy, and syphilis are all associated with insanity, and have their proper pupillary phenomena.

In epilepsy, Gowers states that the pupils in the tonic stage of an attack become dilated and continue so throughout, but if signs of consciousness can be elicited the dilatation ceases. The corneal reflex is also lost during the convulsions. The iris is inactive during an attack and afterward an alternating contraction and dilatation takes place every few seconds, for several minutes in many cases. Inequality of the pupils is found quite frequently. An average of the work of five different investigators makes it 14½ per cent.

A few other general conditions which produce pupillary phenomena can only be mentioned. Mydriasis has been noted in anæmia, depressed nerve tone, aortic insufficiency, irritation of the cervical sympathetic, carious teeth, and diphtheria. Miosis has been noted in cholera, plethora, venous obstruction, mitral disease, pulmonary congestion, and paralysis of the sympathetic.

The subject of pupillary phenomena is becoming of great importance, as the study of the brain and nervous systems advances. Much, however, is being lost, because the family physicians who come in much more close contact with their patients than the specialists, and so can watch the course of diseases more easily, are usually silent concerning their findings in such cases. It is to be hoped that more will report their observations concerning pupillary phenomena in the future.

DISCUSSION.

DR. ELIZABETH L. PECK: I know very little about the subject, though I have been much interested in Dr. Adams' statement in regard to the cases of sclerosis with Argyll-Robertson pupil. I have had cases in my own practice in which the diagnosis was made from loss of knee-jerk and the presence of the Argyll-Robertson pupil.

DR. BUNDY: I will indicate some of the tracts and centres which constitute the mechanism of pupillary phenomena. Only by a knowledge of these can the significance of certain conditions of the iris be understood, especially in cases where pathological changes are due to pressure or local disease. The effects of pressure on even a very small portion of one of these reflex arcs may determine the location of a tumor with accuracy, and this is sometimes more readily recognized by the neurologist than the ophthalmologist.

(Dr. Bundy then pointed out on models of the brain the various oculomotor and visual centres in the cortex and in the basal ganglia, with the tracts of fibres connecting them with each other and with the eye, constituting the reflex arcs through which sensory and motor impulses may be traced.)

DR. PURNELL: I have been very much interested in Dr. Adams' paper, and have been glad to note so many excellent practical points. One point which interested me very much was in regard to narcosis in chloroform, and another with reference to dilatation of the pupil when asphyxia was present. I did not notice whether she said we had the same condition in the administration of ether.

DR. ADAMS (closing): In connection with Dr. Bundy's remarks concerning the location of tumors, I recall an interesting case of an area of softening located in both calcarine fissures which produced blindness, but left the pupils perfectly normal. The eyes reacted both to light and accommodation, showing that the lesions were situated above the primary centres.

With reference to the action of the pupil under ether, it has been impossible to find much data, possibly because most of the writers have been German and used chloroform. Ether does give dilatation and contraction, with fina dilatation if there is asphyxiation, much as chloroform does. I think we, as Americans, should give more attention to this subject.

College Education a Factor in the Physical Life of Women.

By ELIZABETH B. THELBERG, M.D.,
VASSAR COLLEGE, POUGHKEEPSIE, N. Y.

THIRTY years ago college education for women was a new and startling question. Twenty years ago it was still a question. A decade since the question was answered. To-day it is a fact assured. Girls are going to college and in increasing proportion. The old tremors are ceasing to agitate society in general.

The world is coming to the clear and simple view of Matthew Vassar, expressed in one of his earliest communications to his Board of Trustees: "It occurred to me," said Mr. Vassar, "that woman, having received from her Creator the same intellectual constitution as man, has the same right as man to intellectual culture and development."

This plain and now so obvious sentence is printed upon the reverse of the title-page of our Vassar catalogues, which number thirty-four. Wellesley, Smith, Bryn Mawr, the co-educational colleges and universities have risen to justify his prescience. Cavillers have largely ceased from cavilling, and the occasional denunciations of the ill effects of the higher education of women come chiefly from specialists whose opportunities of observation have been chiefly among women.

Dr. William Pepper said ten years ago: "Had these seen, as I have seen, the bad results of high-pressure education of boys under unfavorable hygienic surroundings they would have been as willing to denounce the latter."

Leaving this almost threadbare subject and taking the fact for granted that our American girls are going to college, "not as single spies, but in battalions," what part shall the four college years play in their physical development?

All the environments should be hygienic: the location preferably in the country, so as to admit of out-of-door sports, walks, skating, boating in perfect freedom; the housing, heating, and ventilation above criticism; educated, intelligent supervision of diet; prescription of hours of work, rest, and exercise. Suppose all of these satisfactory; suppose every girl entering college an absolutely

normal, perfectly developed human creature, guidance of the individual is still necessary. But is this a supposable case? Can you pick out from your circle of acquaintances—two hundred to one hundred—ten girls each year in homes, in factories, in shops, in employment of any kind, and say these are of good and strong heredity, these are normal human beings? Mr. Vassar, with a wisdom again long in advance of his time, recognized needs of care, of instruction, and of correction of physical faults, and appointed with his original faculty a professor of physiology and hygiene, who was also a resident physician, and was given general supervision of the sanitary arrangements of the household.

Thirty-five years ago the trustees of Vassar College made this appointment, Dr. Alida C. Avery being the first incumbent. Dr. Brewster was to have told you what Smith is doing on lines of physical development for its students. In the discussion to follow I hope we may hear Wellesley's present position fully given, as I am sure several of her alumnæ are present. The Woman's College of Baltimore will be most ably represented here. Within a month it has come to my knowledge that the two other leading women's colleges are seeking suitable appointees for resident physicians.

The trustees of the men's colleges are rousing themselves to similar care for their students. The gymnastic work at Harvard, Yale, Amherst, etc., is a subject by itself, coming, as the years have passed, more and more under medical prescription and direction.

The new infirmaries at Yale, at Amherst, and at Princeton have been followed by the gift to Cornell of Mr. Sage's beautiful house, by a gift of $50,000 to Harvard for the erection of a new infirmary, and by the accumulation of a fund which has already reached $150,000, the income of which is to be devoted to the salary of a resident physician at Harvard. These signs of the times indicate a growing belief that the aggregation of great masses of adolescents for education in colleges and universities demands trained medical supervision.

This supervision embraces, or should embrace, three cardinal points: Instruction in human anatomy and physiology and in public and personal hygiene. Prevention of preventable diseases and control of contagion. Detection of chronic troubles and of physical defects and their correction.

As to the first point, instruction : This should not be limited to a series of " talks on health," too often looked upon as a mere bore by students. It should be genuine college work, regarded as work by the student, and marked as college work counting toward her degree.

I believe that the person fitted to give this instruction with the requisite moral earnestness is the person who is responsible for the health of the community—the resident physician.

Vassar, for I can instance with most certainty the college with which I am connected, gives a required course in hygiene to all members of the freshmen class, one hour per week of the first semester. This class now numbers usually two hundred, so that it is taught in from four to six sections.

We begin with cell and tissue structure, and make histology the basis of all instruction in personal hygiene. I wish I could have brought with me some of the drawings my girls have made from the microscope in colored crayon and in water-colors. They would do credit, I am sure, to any technical school. I wish, also, I could have brought our recently acquired food museum, originated at the Massachusetts Institute of Technology, and prepared now by one of our own pupils, who is director of the Department of Domestic Science at Pratt Institute, Brooklyn. Doubtless you have the museum here. It is most valuable, showing the actual elements of the common foods preserved in bottles. One of the requirements in the consideration of sanitary science is that every member of the class shall bring back with her from the vacation a profile drawing of the plumbing in her home, showing also the mode of connection with the street sewer ; a statement in full as to the source of her town water-supply ; methods taken by the municipality to ensure purity ; description of the method of sewage disposal in her own town or city ; precautions taken to avoid contamination of neighboring sources of water-supply.

Many a complacent parent and some mayors and water commissioners have been made to open their eyes at these inquiries and suggestions.

I will read, if you will allow me, the questions given to my freshman class last February, as they may illustrate to you the scope of the course practically :

1. Contrast epithelium and connective tissue (*a*) as to structure, (*b*) as to function.

2. Describe, draw, and give the function of spheroidal epithelium.

3. Draw a section of bone tissue. Describe the method by which nourishment reaches the bone corpuscles.

4. (*a*) What are the best bone-forming foods for young children? (*b*) Describe the results of such foods being withheld.

5. What are the relative proteid values of wheat, eggs, beans, potatoes, beef, butter?

6. What are the propelling forces of the circulation of blood?

7. What should be the relative number of red to white blood cells? What maintains this proportion?

8. What changes does the blood undergo in the tissues? What in lungs? Upon what circumstances does this interchange depend?

9. How are typhoid fever and tuberculosis conveyed to individuals? What means should be taken to check their propagation?

10. Give the essentials of sanitary house plumbing. Draw the pipes of your own homes.

My object is to make these girls sometime, and in the good time coming, municipal housekeepers.

An elective in advanced human physiology is offered to the senior class three hours per week for the entire year. This is now taken by from forty to sixty students. The present class numbers fifty-two.

In addition to these two courses each, it has become my custom to give to the members of graduating classes toward the close of their senior year a series of four lectures upon the reproductive system, touching upon human embryology, pregnancy, the crime of abortion, the care and feeding of young children, etc. These lectures are universally attended, I think I may say by every member of the senior class, and I have had assurances for many years that they have been of real service in the lives of many women.

So much for the first point, and yet that is not all, for nearly every office-call and bedside visit and interview for examination may be regarded as a short lesson and lecture.

As to the second point—prevention—I have taken it for granted that Dr. Brewster would cover the ground so completely as to make it necessary for me to do no more than to call your attention to the fact that it is no small thing for the years from seven-

teen to twenty-one to be spent in an atmosphere safe from infectious and contagious diseases—to have even tonsillitis carefully isolated, bronchitis aborted, and pneumonia practically non-existent.

One more thing bearing upon the question of prevention, and if I cite Vassar again and repeatedly, as I must, it is not that I would exalt her horn unduly, but that I take it for granted you are interested in what she is doing for the physical welfare of her students, or your president, one of her most loyal daughters, would not have asked me to speak to you here upon this subject. It is our constant effort, of course, to keep our students' health not only at par but above it. In addition to a generous table, where milk is as abundant as water (we keep our own herd of cows, and so are enabled to control our milk-supply), every student is at liberty to order steak for breakfast each morning, unless steak or chops are the breakfast meal. Every student is at liberty after breakfast, and after dinner at 6 P.M., to provide herself with bread, butter, and a pint of milk for a mid-morning and a bed-time luncheon. And, further, a diet table is maintained, at which, upon the order of the physician, a convalescent or anorexic student may have, for a period of from a week to two or three weeks, chops, steaks, eggs, toast, fruit, with various other simple luxuries upon her own order and free of all charges. She may also have here oysters, chicken, or any other procurable luxury at cost prices.

Just here I will speak of our infirmary, established at the opening of the college, and presided over by our resident Scotch nurse for the last fifteen years. We have fifteen beds in five wards of varying sizes. This infirmary was located upon the fourth and fifth floor of the wings of the original dormitory building. We have been very successful in caring for general illness as well as quarantining contagion with it, never in the last twelve years having had a second case of contagion resulting from a first invading case; but we are rejoicing in the assurance that a new outside infirmary of a larger capacity than our present one is to be erected during the coming summer.

This building, the gift of Mrs. Caroline Swift Atwater, of Poughkeepsie, President of the Vassar Alumnæ Association, is a memorial to her father, Dr. Charles Swift, one of the original trustees.

To turn now to our third point: The detection of chronic troubles and of physical defects and their correction. What chronic troubles and physical defects do we find in entering students, and how do we detect them?

Each freshman as soon after entrance as is possible is given a physical examination, the record of which is kept in a register, a sample page of which I have brought with me:

Name Residence Class No.
Admitted to Vassar College 18 Aged Years Months.
FAMILY HISTORY:
Father Age Race Occupation Health
Mother Age Race Occupation Health
Pat. F. H.
Mat. F. H.
Is child in family.
Brothers living. Health Dead Age Disease
Sisters living. Health Dead Age Disease
Hereditary tendency—Paternal Maternal

PREVIOUS PERSONAL HISTORY:
Was strong as a child. Digestion Constipation Diarrhœa
Catarrh Rheum Malaria
Had measles Mumps Pertussis Varicella Scarlatina
Diphtheria Typhoid Influenza
Eyes Hearing
Attended kindergarten and school from years old to regularly.
Took out-door exercise Bicycle at years. Rode
Sports:
Mens. at year with pain. Nerv. sympts. Interrupted
Present recurrence regular at days interval.
Entire duration days. Active duration days. Amount Character
Pain occurs Character Nerv. sympts. Bed.
Leuc. occurs Character Amount Sympts.

FITTED FOR COLLEGE AT
Had regular gymnasium work Sports Walked

CONDITION ON ENTERING VASSAR COLLEGE:
Weight Development Skin
Eyes Conjunctiva, etc.
Hearing Teeth
Nasopharynx Tonsils
Waist measure dressed inches. Undressed inches (full inspiration).
Corsets since years old. Waists since years old.
Chest expansion inches. Spirometer
Lungs

CONDITION ON ENTERING VASSAR COLLEGE—*Continued.*

Circulatory system: Anæmic Cervical bruit
Blood analysis: Hæmoglobin per cent. No. Red blood-cells No. White cells
Heart
Spine Shoulders Hips
Spinal sensitiveness Pain
Nervous diathesis Neuralgias
Digestion Constipation
General condition

CONDITION ON LEAVING VASSAR COLLEGE:

In College consecutive years. Absent to Cause
Ill Fresh. Soph. Junior Senior year days Average days per annum.
Ailments Soph. Junior Senior year
Physical exam.: Weight Development Skin
Eyes Conjunctiva, etc. Glasses years.
Nasopharynx Tonsils
Waist measure, dressed inches Undressed inches Corsets
Chest expansion inches Spirometer
Lungs
Circulatory system: Anæmic Cervical bruit Heart
Blood analysis: Hæmoglobin per ct. No. Red blood-cells No. White cells]
Spine Sensitiveness Shoulders Hips
Nervous system Digestion Constipation
Mens. regular with pain Nerv. sympts. Bed
Duration days Amount Leuc.
Gymnasium Sports Bicycle
Average hours' exercise Average hours' mental work
General condition

From these pages conditions are classified and corrective and developmental work is begun.

Heredity and predisposition are briefly carried out for convenient reference upon our office-cards. (See cards.)

The object of this examination is twofold. From its data, together with the measurements and tests made by our gymnastic director, the students' exercises are prescribed. Our director, Miss Harriet I. Ballintine, whose popularity is universal and whose general gymnastic work is invaluable to the college, still further renders inestimable service in conducting personally a large amount of our corrective gymnastic exercises. She has given me the following brief statement, which I take pleasure in reading to you:

Exercise in the gymnasium is required of every student throughout her college course, unless excused by the resident physician.

The work consists, primarily, of individual exercise, prescribed

to meet the wants of each student. In addition to the two hours of individual work, freshmen and sophomores are required to take one hour of class drill.

The work in the senior year is entirely elective. Students who have had three years of previous training are offered for their fourth year: individual practice in light or heavy gymnastics, light, free movements, fencing, dancing, advanced Indian-club swinging, basket-ball, swimming or fencing.

Every student can have lessons in swimming sometime during her college course. This year there were 170 lessons given. The tank is 42 x 22 feet, and the water is kept at a temperature of 70° to 80°, and is especially well lighted and ventilated, there being windows on three sides. The swimming-tank was used during the past winter on an average of twenty-two hours every week.

On entering college, in addition to the examination by the resident physician, the students are tested in regard to their muscular strength, and forty-six measurements are taken. Those having lateral curvature and other abnormal cases are given, with the advice of the physician, special gymnastics.

This year, for the first time, anthropometric charts were used. These charts are issued by Dr. Sargent, of Harvard, and consist of tables compiled from the measurements of 10,000 students. The measurements of each student are compared with these tables, and individual charts plotted, showing at a glance the development and what part needs special improvement. Students having these become more interested in their apparatus work, as they understand more clearly for what they are working.

It is the aim of the department to have as much of the exercise taken in the open air as possible, and every effort is being made to encourage students to enter the out-of-door games. Each class has a regular and a substitute basket-ball team. This is played out-of-doors, and a series of match games are held every spring. Both tennis and golf are popular. A tennis tournament is held in the fall, and in the spring the golf championship is decided. A field day, under the direction of the Athletic Association, is given every year. More students have been interested in preparing for these this spring than ever before, and the work has been carried on more systematically. The students have practised regularly out-of-doors since the Easter vacation. All out-of-doors

training is under the supervision of the gymnasium director or her assistants.

That the main object of athletics at Vassar is exercise and not the making of records may be shown from the fact that ninety students took the training, and of these but thirty-three entered for field day.

Below is a list of the events on field day, with the records :

120 yards hurdle (low), time	$21\frac{2}{5}$ sec.
100 " dash, "	$13\frac{4}{5}$ "
220 " run, "	$38\frac{2}{5}$ "
Running high jump	3 ft. 9 in.
" broad jump	13 " 1 "
Standing " "	6 " $10\frac{1}{2}$ in.
Fence vault	4 "
Throwing the basket-ball	54 " 2 in.
" " base "	170 " 3 "

Out of 164 students there were only twelve whose total strength-tests did not improve.

TOTAL STRENGTH-TESTS OF CLASS 1901. 164 STUDENTS.

Fall.	Spring.	Fall.	Spring.	Fall.	Spring.	Fall.	Spring.	Fall.	Spring.
204	213	134	208.5	111.5	137	231	259.5	160.3	221
127	212	210.5	279	175.5	246.5	108	141	219	246
125.5	174.5	212.5	210	126	154.5	147	135	136	191.5
66	57.5	121	145.5	157	180	135	162	92.5	144
142.5	187.5	138.5	217.5	148.5	173.5	216.5	218	259.5	318
153	151	142	175	189	248	133	171.5	99	121
138	188	135	192.5	204	219	141	243.5	169.5	216
120	131.5	161.5	170	200	241	159	235	116	165
82	137	153.5	154	213	242	155	167	102	148
194	210.5	200	295	196	251	156	184	139	225
144	155.5	152	224	142	198	113	204	138.5	183.5
166	233.5	114.5	151.5	198	254	118.5	129	143	163
151	192	150	191	134	166	324	371.5	113.5	166.5
162	195	176	211.5	154	173	183	282.5	172.5	214.5
119	135	266.5	316	210	271	159	222.5	263	296.5
165	195	139	196.5	226.5	212	149	214.5	131	145.5
168	197.5	184.5	204.5	206	235	120	135	149	260.5
128	198.5	101.5	193	94	130	139	153	86	142.5
152	219	297.5	426	197.5	188	180.5	206	98	110
160	238	109	188	135	149	98	142.5	97.5	138
104	108	185	234	193	220	104.5	136	137	171.5
183	262.5	134.5	233.5	130	161	185	218.5	176.5	173
158	221	184	283.5	113	136	152	177	101.5	183.5
133	179.5	206	100	213	257	177	206	170.5	265
185	292	150	178	146.5	179.5	230	225.5	224.5	265.5
206.5	211.5	105	110	163	158	132	208.5	169	193.5
155.5	218	136.5	229.5	121.5	178.5	154.5	139	144	228
191.5	207.5	194	181	121.5	178.5	132.5	271	129.5	191
242	265.5	113	140	111	142	252	280		
118	162	143	164	161	219	171	208		
176.5	205.5	150.5	194.5	106.5	114.5	128	106		
129	173	145.5	180	126.5	207	130	147		
154	227	105	128	117	192	182.5	176.5		
228	283	227.5	269.5	142.5	265	263	340		

Total strength-tests mean strength of back, legs, chest, right forearm, left forearm.

Average gain of the 151 students who did improve equals 45.1 kilos. Some improved as much as 128.5 kilos in their total strength-tests ; some only 15 kilos, and one only 5 kilos.

With few exceptions the twelve who did not improve were very delicate or had a bad spinal curvature.

To return to the freshman examinations. We strive in the second place to put ourselves in the relation of a family physician with each young woman. Not infrequently we find ourselves in a relationship which unfortunately no family physician has ever held.

Now I have not come here armed with long tables of statistics, but here are a few which so interest parents, secondary schools, and yourselves as family physicians that I will give them to you briefly. Out of 191 entering students, the average being 18.4, we discovered, recorded, and in the majority of cases began to treat the following abnormalities :

Spinal curvatures, marked	28
" deviations, slight	50
Anæmia	42
Pelvic troubles, leucorrhœa, dysmenorrhœa	36
Mitral heart murmurs	10
Anæmic and functional murmurs	24
Goitre	12
Deficient lung expansion, etc.	9
Abnormal conditions of nasopharynx	78
" " conjunctivæ	100

We also found history of

Astigmatism	33
Myopia	21
Hypermetropia	11

Of these students only seven have left college from reasons connected with health. And with two exceptions those who have discontinued their work have not been those who were apparently the most hopeless cases.

The two I speak of, having had the existence of a grave degree of scoliosis proven to their parents, left the institution for special treatment.

Several of the remaining cases of lateral curvature were put under the care of Dr. Schaffer, the others placed under the personal

supervision of our very able gymnastic director, and all have continuously improved.

The improvement in general health of the cases of anæmia, dysmenorrhœa, and most particularly in the cases showing nervous tendencies, has been marked in those members of this class who remain with us, and I therefore have to record in this youngest and most crucial class an improvement and gain in general health of 96½ per cent.

Of a class of eighty-five graduates last year, eighty-three gave a remarkably good health record—a small class, but when it entered we were crowded for room and were obliged to turn away over 150. Since then a new large dormitory has been erected.

Six cases, I do not hesitate to say, would have become chronic invalids had corrective measures not been instituted promptly at the beginning of their college course. Of the two who gave a health-impaired record, one had had a severe bronchial cough—grippe—only a short time before. The other had a strong hereditary tendency to tuberculosis, and though no bacilli were to be found, there were physical signs of waning strength, and she was advised to go to Colorado, and is now there gaining in weight every day. From the records of the last twelve years, which I have carefully kept—and to which I am adding regularly valuable data obtained from our alumnæ as they return once in two, three, and five years for their reunions—many most interesting statistics will eventually be compiled. It is of great benefit to have had these records kept continuously by the same hand, as so much depends upon the personal equation and individual interpretation. At least allowing for that, it is something to have but one interpretation.

These statistics will show not only that girls can profitably take a college education that is accomplished, but will prove that grave physical imperfections can be corrected in the period between eighteen and twenty-two years coincidently with the development of the mind along the lines of college work, the college work if not excessive in amount being a real and most important factor in the physical development.

You may ask, "Will not the presence of delicate girls lower standards?" I reply that must never be allowed, and is not. The girl with a faulty physical nature must be improved or she cannot remain. She must, furthermore, be restrained, and often be

compelled to take a five-year course instead of four. But my observations lead me to this conclusion, that often those who need restraint and care and correction bodily are those whose minds are preternaturally good, are keen, quick, sure students who need to be saved from themselves.

The lazy and inefficient find their own levels and go to their own places outside the college gates.

Is it not true that if the mental development of a college education, with all the allied lines of broadening life and outlook, is of distinct value and necessity to a strong woman, is it not true that a woman who is never going to be absolutely well and vigorous physically needs, even more than her happier sister, that widening of her mental horizon, that opening out of interests and expansion of mind and heart which should be the object of education?

The statistics which can be compiled from records of physical examinations of girls entering college may, I trust, before long arouse parents, guardians, teachers, yes, and family physicians, to the urgent necessity of frequent, complete, thorough physical examination of the growing girl.

The diseases of development are most prone to occur during a child's second infancy, when growth is most active, the period of greatest activity being between twelve and fifteen years. Too early for us—an age to be watched and guarded and guided with an especial vigilance by the woman physician. I hope in the discussion to follow that attention may be paid to diseases of development, to causes of spinal curvature and anæmia, to the great need of medical supervision and inspection of both private and public secondary and primary schools.

Our profession and our sex have a great future awaiting them in preventive medicine and in the extension of the maternal function to the care of the children of the State and the nation.

DISCUSSION.

Dr. Lewis: I think Dr. Thelberg's paper shows very clearly the necessity for the thorough retraining of our physicians in this line. The training should be so thorough that the preventive measures should begin in the primary and secondary schools. Within a few weeks the question of physical training and supervision of it has been discussed by the hygienic section of the Civic Club. Dr. Spiegle gave an admirable *résumé* of her work in the Girls' Normal School. The thing most needed is an authority

back of the individual to say when a child is physically able to come up for examination. Cases of spinal curvature have been brought to me for treatment in which I have had long arguments with parents to show that the child was physically unable to do the work they were trying to force her into. It seems to me most important that these positions should be held by women, and that women should be especially prepared for these positions, and the time is ripe for our medical schools to fit them for these positions. As this college has taken the advance in so many directions, I hope there may be drawn up a series of resolutions to the Faculty outlining the scope of the work which should be implied in the department of physical education.

DR. SPIEGLE: I represent an entirely different field from that just outlined as belonging to the college. In the college, of course, the physician has all the girls under her own care. I deal with girls individually as a physician. I represent the Normal School of Philadelphia, and the Normal School is an institution in which those who mean to be teachers in the public schools are trained. Now, a woman physician is needed in every normal school in the United States, also in the secondary, grammar, and primary schools. That woman must fundamentally be a teacher, and she must impress the faculty with the importance of her work, which must stand side by side with any branch of instruction of the school. I mean by that, when the young woman passes to the public school she must give an account of her hygiene as she does of her physiology. As an adjunct, we have the gymnasium, and the young women must go to the gymnasium two hours each week. That is one-ninth of the girl's work, and she must be credited with that before she comes out of the school. This is not elective; the girl must do it.

Students are taught that this body is the instrument with which they are to do their work; that it is their business to refine and polish that instrument. They are taught thorough self-control; also that perhaps they may not teach all their lives, but may become mothers, and I take up all that that means.

We wish to work for medical inspection *before* the girl comes to the Normal School. We wish the girls who come to the Normal School to be well, because it is the one profession which a girl enters without paying money, and for which she owes something to the community. That "something" should be health. I would wish medical inspection to be so important a factor as to necessitate the inspector making the school his or her home. Hygiene should be taught in the grammar grades in its true significance, and taught by one who understands it scientifically.

DR. WELCH: What I might say would certainly be a repetition of what has been said. When I saw that Dr. Brewster was to prepare a paper on "Preventive Medicine," the subject seemed so attractive to me that I began asking myself what I knew about preventive medicine. We at the Woman's College of Baltimore, while in general our plan and object are the same as those outlined by Dr. Thelberg, yet differ considerably, and I think the Association might be interested in a description of our physical training department, because, first, the organization of the department has been

entirely due to members of this Association. The Woman's College of Baltimore was organized ten years ago. Several women have been asked to take charge of it, Dr. Hall being the first. Each succeeding one has been married; I might say I have been there four years.

If the question of the number of hours in a girl's course arises, it is referred to the physician. In so far as sickness is concerned, the students are at liberty to call in any physician they please. The authorities never encourage or discourage the girls to call the physician. I think in the ten years among the great number of girls we have remarkably good health-records. We have had one case of appendicitis operated upon. We have also had one case of spinal meningitis. In the last year we have not called in an outside physician.

The point I wish to make is that purely and simply the college physician has to do with the health of the girls. Our examinations are made as they are in Vassar. The result of each examination is submitted to see if the student has too many hours.

I think the appointment of the college physician as a member of the Faculty gives a dignity and standard which is very essential to the work. We stand for health, for *preventive* medicine, and in no sense for *curative* medicine, though we try to cure when we get a chance. The whole idea of the department is to exalt health, to send out these college women into schools and into homes with the idea that all questions of instruction, of development, are related to the question of health. That is the first consideration, and to that all other things should give way when possible.

With reference to the physical training department, the college physician is the ultimatum; she is the final authority upon the question of gymnasium. In reference to remedial and curative work, before any women physicians enter the college they visit Sweden to investigate the systems there. We have our teachers who are trained to take in hand cases of scoliosis which can be helped by gymnastics; but I have always doubted the wisdom of making that a part of the college work.

One thing we have not accomplished is the control of entrance to the college from the physical training department. We can say that a girl is physically unfit, but we cannot say that she shall stay out. I do hope the day will come when that will happen. One conclusion I think we all have come to: given a girl with average health and preparation for college life, the trouble has been before the girl comes to college; the trouble is with the girl in the secondary school, and here I agree particularly with Dr. Spiegle. It has seemed to me that there is a great widening of the field for women physicians in this elementary work. Sanitary inspection of schools is added. That should be looked after, and the possibility of contagion gotten rid of. I believe the time will come when medical advisers to the school will bear the same relation which the college physician now does to the college.

One point which Dr. Thelberg did not touch upon, and which I think is an attractive field, is involved in problems of a scientific nature. We have in addition to the teaching course a course in general physiology which is in the hands of the college physicians—that is, a real scientific study of

physiology. We have our laboratory, and there are it seems to me many important questions that we ought to work out, questions regarding respiration and blood-pressure and numberless questions which are awaiting us to work out.

Ten years ago, when taking my medical course in this college, this Alumnæ Association decided to raise $40,000 for the establishment of preventive medicine. This morning I was much interested to hear from the report that in ten years there had been collected $850 to $900. At that time I had a rather indistinct idea of what was meant by a chair of preventive medicine. In addition to our different laboratories, we need a laboratory of hygiene.

DR. THELBERG: One of the important consequences of the education of this age is that the next generation of mothers will know enough to restrain and care for their children at the age of development. If we fail to teach that we fail utterly, because the great majority of the girls are going to be mothers, and the majority exercise the maternal function more largely in their own families than in caring for the community.

One word with reference to what Dr. Welch said in regard to the place in the Faculty given the physician. The usefulness is limited in schools in which the physician is not given a chair. The existence of large numbers in dormitories makes it more desirable that the college physician be the attending physician to the college community, because of the danger of the escape of contagious diseases from our control. No restraint is placed upon any student calling in a town physician.

If the students are exposed to contagion they are not at liberty to return until they have communicated a full account of the exposure and precautions taken before their return. That keeps us from a great deal of contagion, and it is educative. I am proud of a great many letters received from students telling me what their exposure has been.

With reference to the entrance of the girls into the college course, in cases where there has been a doubt as to their physical ability, by giving them the benefit of the doubt and proper treatment, they often turn out all right. The improvement has seemed coincident with the development of the mind. I wish I had time to enlarge upon the stimulation and improvement of the brain centres as a factor in many affections. Dr. Pepper said some time ago that this was a distinct, forcible, and almost indispensable factor in the cure of certain conditions.

In connection with these scientific investigations, I should like to say that Vassar has been very generous, and we hope to do a great deal of that sort of work. There are those who experiment and those who practice, and I have not time to do the former.

With reference to what Dr. Spiegle has said, may I say that women physicians will assume their maternal functions in regard to the young of the State when they shall have become citizens of the State.

Chronic Parenchymatous Nephritis Complicated by Purpura Hemorrhagica, with Infection by the Bacillus Aërogenes Capsulatus.

By FRANCES C. VAN GASKEN, M.D.,
PHILADELPHIA.

Purpura hemorrhagica is rare enough and the cause sufficiently obscure to warrant a report of the following case: The patient, a woman, aged forty years, was admitted to the wards of the Woman's Hospital on March 22, 1899. On the day of admission the following notes were made: Body is well nourished where condition is not masked by œdema; the whole surface is covered with diffuse redness, not punctated; over the sacrum and extending over the lumbar region for about six inches is a large ecchymotic area, purple-red in color; several smaller ecchymoses on the back. On the dorsum of the left foot is a depressed wound covered with a dried yellow crust. On the upper lip, extending into the left narium, is a large patch, resembling impetigo, covered with a bloody crust. Œdema of the lower portion of the body, of the abdominal walls, of the back as far as the eighth rib, and of the hands. Orthopnœa. Mental condition: Restless, delirious, with maniacal outbreaks. Physical examination: Dulness in flanks, dulness over the right side of the chest extending posteriorly to the point of the scapula, not separated from liver-dulness in axilla, and not changing with change in position; normal pulmonary resonance over the whole of the left lung and over the right anteriorly; area of cardiac dulness slightly increased to the left; area of splenic dulness slightly increased; spleen cannot be palpated; liver dulness does not extend below the margin of the ribs; fine râles heard over both lungs; over dull area on the right side breath sounds are absent; accentuation of the aortic second sound; at the apex a murmur rough in character, heard with both sounds, not transmitted. Pulse 96, temperature 99.2°.

Urine very scanty; albumin in abundance (solid in test-tube on the first application of the heat test); casts not noted; a few pus cells; reaction neutral; specific gravity 1012; urea 0.6 per cent.

From friends and from the records of St. Agnes' Hospital,

where she had been treated during several uræmic attacks, the following history was obtained: She was born in Ireland, and both parents living and healthy. One brother died of pulmonary tuberculosis. She had been healthy until a severe attack of typhoid fever in March, 1897, since which time she had not been well. She was married at twenty years of age. Three children were born at term; no miscarriages; her husband is healthy. She had used alcohol to excess for a number of years, and had been repeatedly intoxicated, with several attacks of delirium tremens.

During the year 1898 she had several uræmic attacks, and on January 8, 1899, she was admitted to St. Agnes' Hospital uræmic. The resident physician, Dr. J. J. Sullivan, kindly sent the clinical notes, and from it the following points were taken: On admission there was some headache; vomiting, cerebral in character; stupor, which changed to delirium; partial suppression of urine (twenty ounces in the first twenty-four hours). The urine contained albumin, ¾ per cent. in volume, and granular, fatty, and epithelial casts. The pulse-tension was increased, the rate varied from 99 to 102. The temperature, usually subnormal, at one time fell to 96°; it never went above 100°. There was accentuation of both cardiac second sounds; the area of dulness increased slightly to the left of the mammillary line, to the third rib in the parasternal line, and to the left edge of the sternum. The apex-beat was in the sixth interspace. There was no œdema. She improved under treatment, and on March 4th was discharged from the hospital and referred to the dispensary for treatment.

During the time between her discharge from St. Agnes' Hospital and her admission to the Woman's Hospital she was at home, and again returned to old habits of diet and drink.

Under treatment in the Woman's Hospital the œdema gradually disappeared, the breathing improved, and her mental condition somewhat cleared, though she was always quarrelsome and at times violent. There was no change in the dulness over the right lung base with the disappearance of the œdema, and the flush of the skin was constant. On the sixth day after admission casts were found (finely granular) in the urine. The urine reaction was constantly alkaline, with abundant pus and phosphates. The temperature was never above 99°, the general range being below normal. The highest pulse-rate was 105.

On March 25th the skin was broken over the ecchymosis on the

right buttock, but there was no sloughing. On the 27th inequality of pupils appeared. This was more marked each day. On the day of death the left was very widely dilated.

On the 28th blood was found in the mouth. This was supposed to come from a wound on the lip, which she persisted in picking, and her hands were muffed as a preventive.

Later in the day the gums bled when cleansed. The oozing from the gums continued on the 29th, and on the 30th purpuric patches appeared on the hands. The patches varied in size from a ½ cm. to 5 or 6 cm. in diameter. They were dark purple in color, but not ringed. On the left shoulder was a large ecchymotic area; punctiform spots were general. Oozing was constant from the mouth and nose; blood was passed by the bowel, and vomited; the mouth and fauces were very red, but the mucous membrane was nowhere abraded, and the glands of the neck were not enlarged. During the night of the 30th she passed into coma, and early on the following morning she died.

Autopsy, ten hours after death. External appearance: Face cyanotic; blood oozing from nose; emphysema of tissue of the neck and anterior chest; dark-purple discoloration of back of neck, ears, arms, and back; over right thigh a bleb three inches long; skin broken over sacrum; dark-purple discrete spots on upper arms; large blood-infiltrated area on right shoulder; knees dark-purple, infiltrated; ecchymoses in groins and blood coming from vagina; superficial veins distended; abdomen distended.

Section. Subcutaneous fat abundant, color deep orange. Anterior mediastinum emphysematous. Heart: weight, sixteen ounces. Small hemorrhages beneath the epicardium. Coronary vessels distended with bubbles of gas; gas cysts in substance of heart; color of muscle dark-red; left ventricular wall one inch in thickness; small amount of fluid blood in right auricle; left ventricle empty; dark, soft clots in the pulmonary vessels; aortic valve slightly thickened; about one drachm of bloody fluid in the pericardium. Right pleural cavity contains twenty ounces of bloody fluid; old adhesions. In the left pleural cavity there is very scanty effusion. Right lung: weight, fourteen ounces; infarcts in lower and middle lobe; exudes frothy fluid. Left lung: weight, twenty-three ounces; no area of consolidation. Spleen lobulated, weighed eight and one-half ounces; large, engorged, dark; gaseous cysts under capsule.

Kidneys: Right: weight, five ounces; left: four and one-half ounces. Capsules thickened, strip with difficulty. Air-bubbles under capsules, and stellate ecchymoses. Cortex narrowed; color a deep purple red. Pelvis empty. Suprarenal bodies small, engorged.

Liver: Weight, forty-five ounces, very large and pale (fatty and cirrhotic). Innumerable air-bubbles under surface of capsules. Gaseous cysts in substance of organ; resonant on percussion; border thin; bloodless, friable; on section gas escapes. Gall-bladder empty.

Stomach distended. Gas-bubbles beneath serous coat; ecchymoses in submucosa. Pancreas extremely red and exudes frothy fluid. Intestines greenish. Air in mesentery and in subperitoneal coat of intestine. Glands not enlarged. Fat abundant. No solution of continuity of mucous coat of intestine.

The important point in the ante-mortem diagnosis was the cause of the purpura. That she had a chronic parenchymatous nephritis was certain, and a cirrhotic liver was inferred; but were these pathologic conditions sufficient to cause so great a disorganization of the blood? The peculiar color of the skin and the enlarged spleen pointed to an infection, and the open and bleeding area on the lip was considered as a possible point of entrance of the infective agent. The injury on the foot was old and quiescent; on the back the skin broke late in the course of the disease; there was no evidence of gastro-intestinal irritation, and the uterus was apparently in a healthy state. And the early and violent manifestations in the mouth and nose might add something in favor of the lip injury.

In looking up the literature on the subject four points were kept in mind: 1. Cases of purpura hemorrhagica accompanying demonstrable disease. 2. Cases following infection. 3. Cases reported with post-mortem demonstration of the bacillus aërogenes capsulatus. 4. Cases where the last-named organism was found with purpura as a symptom.

In an exhaustive article by Welch and Flexner,[1] collecting all cases reported to date of infection by the bacillus aërogenes capsulatus, no mention is made of purpura as a symptom, nor do Erdmann and Dunham[2] note it in a later collection.

Hamilton[3] reports a case so similar to the above that it seems worth while to give full notes of it. A young man, aged twenty-

two years, student of the McGill University, with no history of syphilis or alcoholism, and no previous illness, began spitting blood, with simultaneous appearance of purpuric spots over the body. The spots increased in number and size with hemorrhages from all the mucous surfaces. The palate swelled, and there was œdema and congestion of the eyelids. Death occurred in eleven days from the onset of the symptoms. Before death the temperature rose to 104°, the pulse became rapid and weak, with delirium. Heart, lungs, kidneys, digestive system, and ocular fundi were normal. There was a slight decrease in the hæmoglobin (87 per cent.); the hæmocytes numbered 4,840,000, and the leucocytes 6000 per cm.

Autopsy, ten hours after death. Large and small purpuric patches on the external surface; no ringed spots; petechia has no relation to hair follicles; heart shows ecchymotic areas; gas-bubbles in vessels of epicardium; some emphysema of serous coat; gas free in right auricle; subendocardial hemorrhages; areas of necrosis in left ventricular wall; valves normal in great vessels, mixed frothy clots; bloody fluid in the pericardium; lungs, subpleural ecchymoses; frothy fluid in vessels; intestines largely distended with gas; gas free in abdominal cavity. Hemorrhagic area in lower part of ileum 7 cm. long, covered with slough; rugæ of duodenum swollen; no change in Peyer's patches; hemorrhage in stomach mucosa; cæcum and transverse colon congested and ecchymotic; submucous hemorrhage in rectum; liver gaseous, floats in water; spleen small, dry, flabby; air in vessels, floats below surface of water; pancreas congested. Suprarenals soft; kidneys hemorrhagic, float. Hemorrhagic areas in bladder; urine frothy.

Cultures from blood gave bacillus aërogenes capsulatus; from heart, spleen, kidneys, and liver, staphylococcus pyogenes aureus. From the spleen an organism resembling the colon bacillus was found in addition to the other organisms.

Pure cultures of the latter organism injected into a rabbit caused death in fourteen days. Cultures from the peritoneum of the rabbit caused death in forty-eight hours when injected into a mouse. No ecchymoses in either case.

Sections of all organs showed bacillus aërogenes capsulatus.

Hamilton concludes: 1. From the history and course the bacillus aërogenes capsulatus is not primary. 2. The staphylo-

coccus pyogenes aureus is primary, but there is no evidence of pus and no collection of cocci found. 3. Of the third form nothing definite can be said. Similar forms have been described in cases of purpura, but inoculations into rabbits and mice are negative.

He doubts that the area in the ileum was primary, giving as his reasons the existence of the hemorrhagic spots without constitutional symptoms. The late appearance of constitutional symptoms he thinks is an important point.

The following cases are suggestive of purpura hemorrhagica with bacillus aërogenes capsulatus as a possible factor :

I. Case reported by Graham, Stewart and Baldwin[4] of general emphysema following abortion. There were profuse hemorrhages from the uterus, bloody urine, and a general redness of the skin, the latter persisting after death. This general redness of the skin, which, it will be remembered, was present in the case under consideration, is noted by Eareckson.[5]

II. Case of purpura with hæmothorax in gonorrhœal subject, reported by Weber.[6] On paracentesis frothy fluid escaped from the chest. This was supposed to be due to an erosion of the pulmonary pleura consequent upon hemorrhages under the surface.

III. Cases of purpura hemorrhagica following injury to the toe, with erysipelas, reported by Kenniston.[7] At autopsy hemorrhagic spots with ulceration and gas-bubbles were present in the intestine. Liver was large, fatty, and cirrhotic. Kidneys were normal. Negative results were reported from cultures on agar and bouillon, taken from liver, spleen, skin, and blood from the heart.

Of purpura occurring in other infectious diseases there is abundant evidence. Sansom[8] reports a case following acute pemphigus ; Babes,[9] a case following malignant pustule. In a Warsaw journal for 1892 a case is reported following croupous pneumonia. Martin[10] reports a case with sarcomatosis ; Weber[11] a case due to bad teeth, and one in a diabetic subject with an acute attack of indigestion as the exciting cause. Clara Dercum,[12] analyzing twenty cases, found three following scarlet fever (four, if her own be included), two, pneumonia ; two, measles ; one, whooping-cough ; one, gastro-enteritis ; one, impetigo ; one, digestive trouble, the attack immediately consequent upon feeding with milk from a cow with abscess of the udder ; the seven remaining were without

assignable cause. Of these seven, two were in the same family, occurring in close sequence, pointing to a common infective agent. Pepper, discussing a paper of Musser's[13] on rheumatic purpura, instanced a case of purpura following influenza.

In an analysis of 200 cases treated in the London Hospital, Stephen MacKenzie[14] gives rheumatism as the cause in sixty-one, and ten more of possible rheumatic origin. Bright's disease has nine; heart disease eight; scurvy, privation, and dietetic causes eleven; anæmia six; tuberculosis four; drugs three; pyæmia, ulcerative endocarditis, syphilis, alcoholism, convalescence, and injuries each two; hæmophilia, peripheral, neuritis, varicose veins, cirrhosis of liver, whooping-cough, rickets, malaria, and leucocythæmia each one; in the remaining sixty-eight the cause was unknown or not given.

Added to these the not uncommon occurrence of purpura in rheumatism and its occasional manifestations in the more violent infective diseases, such as smallpox, scarlet fever, measles, diphtheria, and anthrax, and there is a long array of evidence in favor of the disorganization of the blood by infective processes, and its consequent escape from the vessel walls under the skin and upon the mucous surfaces. And, on the other hand, an equally accumulating mass of evidence against any one bacterium as being the specific infective agent, although observers[15] have succeeded in producing purpura by inoculation with certain organisms isolated by them from cases of purpura and injected into rabbits.*

Watson Cheyne[16] says: "The presence of bacteria in the blood (in cases of purpura) does not necessarily imply their entrance as the starting-point of the disease. The alternative view may be entertained, however, although the primary cause may be of quite a different nature. The abstraction of the fluids of the body may be such that of the numberless organisms in the mouth and intestinal tract certain species may be enabled to penetrate into the blood and live in it."

The toxins and albumoses manufactured in the body, acting under abnormal conditions, by producing chemical alterations in the blood or changes in the blood-pressure, by acting on the

* In a case of purpura hemorrhagica under observation in the Woman's Hospital at the present time (December, 1899), Dr. Peckham got a pure culture of the colon bacillus from the blood taken from under the bleeding gums.

vasomotors, or both acting in combination, have been advanced as a cause of the hemorrhages.

No constant pathological changes have been demonstrated in the blood or vessel walls. The white cells have been increased in some cases, in others the red have been diminished. The red cells occasionally have been found degenerated, but this is not constant. Neither has decreased coagulability of the blood been established. In the vessel walls endarteritis, thickening, narrowing of the lumen, hyaline and fatty degeneration, and secondary thrombosis have all been found.

BIBLIOGRAPHY.

1. Journ. Exper. Med., vol. i., No. 1. Welch and Flexner.
2. Boston Med. and Surg. Journ., February, 1897. Erdmann and Dunham.
3. Montreal Med. Journ., 1897, vol. xxvi. Hamilton.
4. Columbus Med. Journ., August, 1893. Graham, Stewart, Baldwin.
5. Medical News, Philadelphia, 1893, vol. lxii. Eareckson.
6. New York Med Journ., 1897, vol. lxv. Weber.
7. Amer. Med. and Surg. Bull., New York, 1894, vol. vii. Kenniston.
8. Trans. Clin. Soc., London, 1893-94. Sansom.
9. Deutsche med. Wochenschr., Leip. and Berlin, 1896, vol. xxii. Babes.
10. Journ. Exper. Med., New York, 1896. Martin.
11. New York Med. Journ., 1897. Weber.
12. Med. and Surg. Reporter, 1892. Dercum.
13. Trans. Assoc. Amer. Phys., Philadelphia, 1891. Musser.
14. Allbutt's System of Medicine.
15. Beitrage zur path. anat. Allgemein Pathologie, 1890, vol. vi. Tizzoni and Giovannini.
16. Trans. Patholog. Soc., London, 1884. Watson Cheyne.
17. Internat. Clinics, Philadelphia, 1894, vol. ii. Grawitz.

A BACTERIOLOGICAL STUDY OF THE TISSUES AND FLUIDS IN THE CASE ABOVE REPORTED.

BY ADELAIDE WARD PECKHAM, M.D.,
PROFESSOR OF BACTERIOLOGY IN THE WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA; DIRECTOR OF THE CLINICAL LABORATORY OF THE WOMAN'S HOSPITAL.

COVER-SLIP preparations were made from the various organs and tissues of the body. On examination, a large bacillus seemed to be the only organism present, with the exception of the preparation from the heart's blood, which contained both bacilli and streptococci. The bacilli were very abundant, and occurred singly or in pairs end-to-end.

Cultures were also made from the organs and fluids. The medium used was 2 per cent. glucose agar-agar. Both aërobic and

anaërobic culture methods were employed. The anaërobic culture-tubes were placed in an atmosphere of hydrogen or in the pyrogallate jar of Buchner, and were then incubated for twenty-four or forty-eight hours.

By the anaërobic methods a growth was obtained in all of the culture-tubes prepared from the different tissues, namely, from the liver, spleen, kidney, pancreas, brain, intestinal wall, blood from the heart and from the coronary artery, and fluids from the pericardium, pleura, and ventricles of the brain. Each culture produced a large amount of gas, the agar being full of bubbles and split into segments, which were separated by gas and forced to different heights in the culture tubes. On opening the sealed culture jars an odor suggestive of stale bread and butter was diffused throughout the room. Later, while working upon this organism, it was with difficulty that the hands and clothing were freed from the odor of this gas formed in the medium containing sugar. It was not the intensely putrefactive odor which was noted in the patient several days before death, and which was very marked during the autopsy. Later, during the experimentation upon animals, an odor of decomposition was very marked in the animals that died after inoculation with the bacillus under discussion. This difference in odor under different conditions seemed to be due to the prominence given to one or the other function of digestion. When grown upon a medium containing an excess of carbohydrate material the functions of fermentation would be most active, but in the animal tissues the proteolytic function would by its subsequent activity cause a rapid disintegration of tissue and consequently an odor of putrefaction.

Cover-slip preparations from these anaërobic cultures showed an abundance of a large bacillus similar to the one seen in smear preparations from the organs ; but in most instances, contrary to the indications pointing to a pure culture of the bacillus in most of the organs, cocci or small bacilli were also found.

The aërobic cultures did not contain the large bacillus observed in the organs and in the anaërobic cultures. Some tubes were sterile and others contained cocci and small bacilli.

Experiments Upon Guinea-pigs.

No. 1. This animal was inoculated soon after the autopsy with 1 c.c. of bouillon containing a very small amount of disintegrated,

pulpy pancreas, which was introduced subcutaneously. In two or three hours the animal appeared to be very sick, and had several convulsions. The next morning, however, the temperature was normal and the animal seemed well. A large phlegmon formed at the site of inoculation, and two days later the area around the site of inoculation was ulcerated, and, still later, there was necrosis of the muscles and a small aperture through the abdominal wall. This spot gradually healed, and the animal was active and ate well during this period.

No. 2. A second animal was also inoculated subcutaneously with bouillon containing a larger amount of the pancreatic pulp than was used in the first animal. It died twenty-four hours after inoculation. A large gaseous phlegmon formed quickly in the right inguinal region. An autopsy was made soon after the animal died. On section a large amount of hemorrhagic fluid was found separating the skin and muscular layers over both inguinal regions, and the other portions of the abdomen showed hemorrhagic œdema. The inguinal and axillary glands were hemorrhagic. The parietal layer of the peritoneum was somewhat injected, but there were no signs of peritonitis, and the organs looked nearly normal.

Cover-slip preparations from the organs and fluids of this animal showed a large bacillus, and in some instances small bacilli and cocci. Cultures made from the site of inoculation and from the various organs were grown anaërobically, and showed a large bacillus similar to the one obtained before. The abdominal organs were placed in the incubator for a few hours and were then much distended by gas.

No. 3. The third pig was inoculated subcutaneously with 5 c.c. of hemorrhagic fluid taken from the inguinal region of the second animal. It died in twenty-four hours. The body was kept in the incubator for a few hours. On section the whole body was found to be distended, and the organs and subcutaneous tissues showed the presence of gas.

No. 4. This animal was also inoculated with the hemorrhagic exudate from the second animal, but a much larger quantity—1 c.c. —was used. This animal died in twenty-four hours. After lying in the incubator for a few hours the body was much distended, and the organs were ruptured in some instances.

Cover-slip preparations from the organs and exudates of pigs

3 and 4 showed an abundance of the large bacillus observed in the other cases, and also a small bacillus which proved to be the bacillus coli communis. Pure cultures of the large bacillus were obtained from Petri plates inoculated with a bit of macerated liver and grown in a pyrogallate jar. From this pure culture a fifth animal was inoculated. The culture was broken up in bouillon and injected subcutaneously.

No. 5. This animal died twelve hours after inoculation, and the body was also placed in the incubator for a few hours. It was then distended, and gas-bubbles were found in the organs, especially of the liver, and in the coats of the intestines. A brownish, frothy fluid was found in the serous cavities and in the organs. The auricles and ventricles of the heart were much distended, and there was an appearance of beginning rupture at the apex of the ventricles.

The large bacillus was also recovered from this animal.

Micro-organism Studied in Pure Culture.

A bacteriological study of the micro-organism obtained from the organs and exudates and carried through several animals gave the following result:

Morphology. Large, stout bacilli, for the most part straight, a few rods curved, resembling somewhat the anthrax bacillus. They are seen singly, but oftener in pairs, and occasionally in short chains. They stain easily with all of the aniline dyes, are not decolorized by Gram's method, and show a capsule when a cover-slip preparation grown in animal tissue is stained by the acetic acid method of Welch. The capsule shows distinctly in some bacilli in one preparation, while in others it is seen as a definite, impassable area around the bacillus. In the artificial cultures a few bacilli show this area. It is non-motile and does not form spores under the usual methods of cultivation. The most peculiar characteristic of this bacillus is its tendency to show differences in length, size, and appearance under different conditions.

Biology. This bacillus grows upon all the artificial media in general use. It is strictly anaërobic. When grown in an incubator upon agar-agar plates, grayish-white colonies are abundant in twenty-four hours. In glucose agar-agar large amounts of gas are formed, the medium being completely riddled with bubbles, which collect and force a passage between segments of the agar-

agar. Upon gelatin the growth is slow, the gas appearing about the third day, and much later the gelatin slowly liquefies. Upon potato there is no visible growth. The potato becomes moist, and bubbles appear in the water of condensation at the bottom of the tube. Milk is coagulated, and clear serum forms in twenty-four hours. Upon blood serum a good growth is obtained. In cultures examined forty-eight hours after inoculation no spores were found. This is contrary to Dunham's observation of the bacillus aërogenes capsulatus, the organism with which the bacillus under consideration seems to correspond in every other particular. A longer growth under anaërobic conditions may, however, be necessary.

These characteristics are the principal ones observed in the study of the bacillus obtained from the organs at the autopsy. They correspond closely to those of the bacillus aërogenes capsulatus as first described by Welch and later by a number of investigators who have studied this micro-organism.

Pathology. The pathological conditions caused by this infection have been quite minutely described of late in several interesting articles. The conditions are studied, first, to discover whether the gas formed in the tissues is due in the particular case under consideration to the activity of the bacillus during the lifetime of the person or to a post-mortem condition. Second, if the activity is ante-mortem, what lesions are recognizable as due to this infection?

At this time the tissues of only two organs—the kidney and the spleen—have been studied in this case.

The kidney shows microscopically a condition of cirrhosis. Regions where the connective tissue is much increased contain islands consisting of less altered tissue. In some portions Bowman's capsule is thickened, the vessels of the glomeruli are hyaline or the endothelium is devoid of nuclei. In other regions the glomeruli appear to be normal, and in still others the capsule of Bowman seems to be normal, but the glomerular vessels and endothelium present a necrotic condition. There is a parenchymatous degeneration of the epithelium of the tubules over large areas, and granular coagula are seen. This condition is especially marked in the convoluted tubules.

In many areas the tissues have been pushed apart by the formation of gas cysts. These cysts are not circular, as would be the case in a tissue which was equally resistant on all sides, but long,

irregular areas are seen which seem to be made by the splitting apart of muscular fibres. In some instances the process is just beginning, and large masses of bacilli are distributed in irregular masses.

The spleen shows considerable thickening of the vessel walls, and in many portions of the tissue the splenic cells are necrotic. Large areas take on a yellowish-pink color from the eosin stain, the nuclei of the cells being almost entirely absent. Considerable blood pigment is seen. Gas cysts are present, and are more circular in shape than those in the kidney. Around these cysts the cells are even more necrosed than in other parts.

The general extensive cell necrosis of the tissues examined in this case makes it difficult to determine by the actual microscopical observations of the cells around the gas cysts whether they are really affected by the presence of the bacillus. Other observers have found that cells around gas cysts are degenerated as compared with those of other regions of the same tissue. The nuclei do not stain, and contain fat droplets, and the cells peculiar to the part and also the endothelial cells of the adjacent capillaries are shrunken. In most of the cases reported, however, the bacillus is supposed to have gained entrance to the tissues during life, but it has become active for the most part after the death of the patient. In such cases the areas around the cysts might be the only ones in which the cell suffered. In the case under consideration the infection must have gone on for several days, and the toxins produced by the micro-organisms may have caused a much more general cell necrosis. We have selected for observation that portion of the kidney tissue which is least degenerated, and where the cells retain their nuclei. Around these gas cysts we find masses of bacilli, and the adjacent cells show markedly a much greater degeneration than the tissues beyond.

The cases afforded by the literature upon this subject, which seem most similar to the one being reported, are one of hypertrophic cirrhosis reported by McClellan and a case of hemorrhagic pancreatitis reported to the New York Pathological Society by Dr. John H. Larkin. In both instances there was an invasion of the bacillus aërogenes capsulatus.

In the first case the hemorrhages were very severe. The patient vomited large quantities of blood. The stools and expectorations were bloody. On autopsy the abdominal organs were found filled

with gas-bubbles, the spleen was soft and necrotic, the liver was cirrhotic and showed bacilli collected mostly around the central vein. Clots were found in many vessels. The port of entry in this case was thought to be the ruptured œsophageal veins. The author thinks it probable that the bacillus gained entrance to the liver through the intestinal coats, which were impaired by venous congestion.

DISCUSSION.

DR. EVERITT: You will remember from the clinical history that there were purpura spots at the time of admission, which was about ten days before the death of the patient. This is, according to my reading, an unusually long time for the manifestation of such an infection, the longest certified duration of this infection in my reading being seven days. The purpura increased very steadily during the life of the patient, and from these associated patches the entire dorsum of the body was soon involved, and to some extent the sides of the body. In the cases reported by Dunham, I was interested to notice that they had obtained the bacillus in four before death by making incisions into the emphysematous tissues. One of the points appealing to me as of special interest has been whether or not this organism was pathogenic to man or whether it was really an organism affecting only the devitalized tissues. This would seem to prove that tissues not entirely devitalized form a soil for the action of the organism, but in no case was the organism cultivated a long period before death.

In one of the recent cases reported in which the bacillus seemed to have a predilection for the brain, the microscopic specimen showed the mass of the organism especially filling the ends of the veins. This seemed to me to bear some relation to the purpura, and that in the transmission of the organism by the venous channels rather than the lymph channels we would have some key to the situation of the infection.

DR. PECKHAM, closing: I have very little to render, except, at Dr. Van Gasken's request, some points of differential diagnosis in different forms of purpura. I never had a case under my care, nor have I seen a case in the hospitals.

In looking over the literature, I think the three forms are not so difficult of differential diagnosis, because the simple form has no pronounced symptoms. The spots are extremely small. Attending the eruption there is often a diarrhœa. The purpura rheumatica seems much more difficult to diagnose. The eruption appears about two weeks after the first symptoms; as soon as the spots appear the pain and soreness disappear. With this we have the urticaria, and I think the difficulty in diagnosing this from syphiloderm is more difficult than from other purpura. The last one seems to me to be purpura hemorrhagica.

Dr. Osler puts simplex hemorrhagica under one head. According to his definition, these cases were of the infective variety.

I should say that with the large ecchymoses, the general hemorrhage

from the mucous membranes, the internal hemorrhages, the very strong premonitory symptoms, the appearance of the eruptions and the presence of the organism, the differential diagnosis could be easily made. I think the case reported was one of the few instances in which the mixed infection was found.

In regard to the devitalized tissue, that must always occur when the bacillus gains entrance. I have reported two cases in which there was no real injury. In most cases it is supposed to come from the condition of the circulation. It is carried by the blood channels and must be carried by the lymph channels, although they do not carry the vessels of air. I am quite sure it is carried by them from their altered size.

With reference to the liver being the seat of the organism: of course, that may not be, though the liver is the most favorable substance in which the organism would act. In the cases reported where the organism has appeared only a little time before death the liver was the only organ in which it has been found.

Report of a Case of Leukæmia.

By FRANCES R. SPRAGUE, M.D.,
SAN FRANCISCO.

The following case of splenic myelogenous leukæmia is presented more for its rarity and interesting post-mortem findings than for any light to be thrown on the subject or for special information gained.

M. F., a boy, aged eleven years, entered the medical ward of the Children's Hospital, December 16, 1898. His family history was poor, his father and four paternal relatives having died of tuberculosis; two sisters were suffering from bronchial affection; one cousin was in the tuberculous ward of the hospital with spinal caries, and another cousin was treated at the hospital dispensary for intestinal tuberculosis.

At birth the boy was apparently healthy. He was breast-fed until two years of age, walked at eighteen months, and had his first tooth at two years. . He had had all of the usual diseases of childhood, having had diphtheria a few months previous to admittance to the hospital.

During the last of August and the first part of September, 1898, his abdomen began to enlarge. In the early weeks in September he had a severe epistaxis and developed what was diagnosed as diphtheria, though there is no history of verification by a

Arrows show where spleen extended below iliac bone. [Taken about January 30, 1899.]

culture. This attack lasted three weeks, after which he was apparently well for one week, when a general weakness developed, the abdomen became very much distended, and the case was pronounced "typhoid malaria." At this time he had excruciating pain in his left leg and foot, and the leg became swollen. For two days he was unconscious, to all appearances, was unable to see, and in a state of collapse. Then, apparently, began a slow convalescence. His bowels during this attack were loose, and the stools often contained blood.

On admittance to the hospital the boy presented a most distressing appearance. The emaciation was very great, the pallor extreme. His abdomen was greatly distended and somewhat sensitive. The superficial veins over the abdomen were much enlarged. Liver-dulness extended a finger's-breadth below the costal arch, but did not seem abnormally extended in other directions. The spleen extended to a finger's-breadth above the crest of the ilium, to the right about three fingers'-breadth to the left of the umbilicus, and about three fingers'-breadth back from a line drawn from the axilla to the crest of the ilium. The splenic notch could be plainly felt. The axillary glands were slightly enlarged, but there was nothing abnormal in either the cervical or inguinal glands. From the family history, tubercular peritonitis suggested itself; and then, again, some malignant trouble seemed possible. The examination of the urine showed nothing abnormal. An examination of the blood by Dr. Harold Brunn, of the hospital, showed it to be a case of splenic myelogenous leukæmia. The boy was put on Fowler's solution, ♏iij, well diluted, three times daily, and a generous diet. Inside of a week arsenic had to be stopped. It was tried repeatedly, but with the same result. Iron and cod-liver oil were given in conjunction with the arsenic, and kept up in the intervals, when the arsenic was discontinued.

The blood was examined from time to time, each examination showing an increase in the white blood-cells.

On January 30, 1899, a photograph was obtained, and the physical examination showed a great increase in the size of both liver and spleen.

About February 27, 1899, he began to suffer severe pain in his head and feet. This was controlled only by morphine, which was given in one-sixteenth grain doses as required. He became

quite deaf, could hear noises, but could not distinguish words. We communicated with him in writing, but in two days he was unable to see. An attempt was made to examine his eyes, but his extreme nervousness and inability to understand prevented a satisfactory examination.

On March 1st the whole body became œdematous, the pain increased, and the dose of morphine was increased to gr. $\frac{1}{8}$ when needed.

On March 6th an attempt was made at a physical examination, but he was so sensitive that it was impossible without causing extreme pain. It was found, however, that the liver was enormously enlarged, the outline not being determined, while the spleen had lessened in size, being about as large as when he entered the hospital. About one week later he died. During this last week he was kept almost constantly under the influence of an opiate, as his suffering was acute without it.

His temperature while in the hospital averaged 38° C. in the evening, and 37° C. in the morning. His pulse averaged about 100, except toward the end ; his respiration between 20 and 30.

The urine at no time contained albumin, casts, or sugar, but frequently contained urates and uric acid crystals in abundance.

DIFFERENTIAL BLOOD COUNT.

	On entrance.	*Feb.* 27, 1899.
Lymphocytes	3.8 per cent.	4.8 per cent.
Polymorphonuclear neutrophiles	33.0 "	45.1 "
Myelocytes	54.0 "	52.0 "
Eosinophiles	4.0 "	2.6 "
Nucleated reds	1.6 "	2.3 "
Red blood-cells	2,230,000	2,450,000
White blood-cells	800,000	830,000
Hæmoglobin (about)	25 per cent.	Impossible to estimate accurately.

The difficulty in estimating the hæmoglobin was due to the turbidity caused by the large increase in white blood-cells.

Post-mortem by Dr. Harold Brunn. External appearance: Body emaciated, abdomen large and distended, spleen and liver palpable, the former extends within four fingers'-breadth of the iliac crest and a hand's-breadth from the umbilicus, the latter projects about three inches below the free border of the ribs.

Legs, feet, and hands are œdematous.

GENERAL INSPECTION. The parents refused to allow the skull opened.

Abdomen. Peritoneal fluid increased, clear straw color. Liver and spleen enlarged. Diaphragm extends to fourth interspace on left and to fourth rib on right side.

Chest. Lungs free. Pericardial sac distended with clear straw-colored fluid.

ORGANS. *Heart.* All cavities contain blood clots, the right heart being greatly distended. The clots in the heart, as also those in the bloodvessels, are muddy, brownish-red in color, and have a curdled rather than a smooth appearance, resembling a jam rather than a jelly. Left ventricle wall thickened. Right ventricle wall thinned. Valves, except for a slight thickening of the mitral, have a normal appearance.

Left Lung. Numerous small nodules from the size of a pea to a walnut felt throughout the lung substance. They slightly elevate the external surface, are firm to the touch, and sharply defined. The entire lung, both to the touch and to the knife, gives the impression of a solid organ. It floats in water. On section the nodules are of a dark-red color and sharply defined from the surrounding lung substance.

On the anterior border of the left upper lobe is a more prominently raised irregular area, which on section is found to be a cavity with ragged irregular walls, greenish in color, flecked with yellowish-white spots, and containing a thick yellowish material. It resembles a tuberculous cavity.

Right Lung. Except for absence of cavity, the formation presents an appearance similar to the left lung.

ABDOMINAL ORGANS. *Spleen.* Weight, two and three-quarter pounds; length, 24 cm.; width, 13½ cm., firmly adherent to abdominal wall, diaphragm, and omentum. The surface presents a marbled appearance, the yellowish-white areas due to thickening of the capsule. On its upper anterior surface is a large, irregular, white spot which extends about one-half inch into the splenic substance, a cicatrized infarct. On section the spleen is very firm, Malpighian corpuscles not marked. The blood exuding from the spleen is brighter red and thinner than found in other organs.

Liver. Weight, seven pounds; length, 34½ cm.; width, 26 cm., greatly enlarged, mottled and reddish-yellow in appearance. On section, fatty change. A thick, dirty-red fluid exudes from cut surface.

Right Kidney. Capsule strips readily, cortex swollen, Mal-

pighian bodies marked. Organ is congested. Chocolate-colored fluid exudes from cut surface.

Left kidney presents similar appearance.

Pancreas has a decidedly pinkish hue on section.

Intestines. Lymph-follicles not particularly marked, enlarged lymph-glands size of pine nuts filling the mesentery along the course of the splenic vessels and in the mediastinum. On section firm, grayish-white color.

Abdominal veins are intensely engorged. Bone-marrow from clavicle is thick, brownish-yellow material resembling disintegrated blood and pus.

Microscopical examination of all the organs gives the typical picture of intense engorgement of their vessels, the contained blood showing immense numbers of deeply-stained leucocytes, the red blood-cells being largely obscured.

Lung. The walls of air sacs are thickened from distention and filling of capillaries with leucocytes. The lumen of all the blood-vessels is filled with a mass of deeply stained white blood-cells, excepting two of the largest bronchial vessels, whose contained clot has undergone coagulation necrosis. The mass is homogeneous, granular in appearance, with indistinct and broken-down nuclei.

Section through that part of the left lung with a cavity shows its contents to be pus-corpuscles clinging to a ragged, irregular wall. The lung substance surrounding the cavity has become transformed into a homogeneous denucleated mass containing granular detritus from broken-down cells, sharply defined from surrounding lung tissue.

Spleen. Malpighian corpuscles are not distinguishable. Splenic pulp dense. Fibrous trabeculæ well marked. Several areas found about the shape of but somewhat larger than a Malpighian corpuscle in which the splenic substance has disappeared; a smooth necrotic area unmarked, with nuclei taking its place. Surrounding these areas the splenic substance is infiltrated with blood.

Liver. Liver cells pressed upon and obscured by the densely filled portal capillaries whose deeply stained contained leucocytes in places give somewhat the appearance of an injected specimen.

Kidney. Malpighian bodies are well marked. Glomerular and circumglomerular tissue infiltrated with leucocytes. Slight infiltration between the tubules of the cortex.

Pathological Diagnosis. Enlarged leukæmic spleen; ischæmic

infarcts of spleen; enlarged fatty leukæmic liver; leukæmic kidney; infarcts in both lungs; liquefaction necrosis of infarct in left lung, with cavity formation; enlarged retroperitoneal, mesenteric, and mediastinal glands.

As a positive cause of leukæmia in children seems still obscure, so the exciting cause of this case is doubtful. The history of late teething and walking points to rhachitis, yet the boy presented no marked signs of rhachitis. Neither were there signs nor history of syphilis, which authorities cite as a predisposing cause. There naturally arises the question as to tuberculosis, in view of the decided history to exposure, but the autopsy did not verify this. Certainly the leukæmic condition was present sometime before those who cared for him noticed it.

The fact that arsenic, even in small doses, was not well borne is interesting, as all available literature notes the tolerance of large doses. The proportion between the red and white blood-cells is also a noteworthy point, as but a very small number of the reported cases give so small a proportion.

Another interesting feature, and one that I have not seen mentioned particularly, was the marked decrease in the size of the spleen during the last days of life.

Abstract of Paper on "The Treatment of the Insane."

By CALISTA V. LUTHER, M.D.

Dr. Luther withholds her paper from publication on account of its personal nature, and only the merest outline can be given here. The cases reported two years ago as cured have remained so, and of those admitted since, 60 per cent. have recovered, the remaining ones being still under care. The improvement in these has been so marked that there is every hope of final recovery.

Dr. Luther is more and more convinced that it is not medicine or surgery that these patients need, but kindness, firmness, truthfulness, and unlimited patience. She also emphasizes the necessity of early removal from home and complete isolation from friends and relatives. She finds the families of the patients often as hard to deal with as the patients themselves, and she reported a case of a young lady who had repeatedly been on the verge of

recovery and had been thrown into a condition of acute mania by a visit from her mother or one of her brothers. At the time of writing the paper, this patient was in such a deplorable condition that Dr. Luther despaired of ever seeing her any better. She had to be fed with a tube, was unable to dress herself or form a connected sentence, and often required two nurses to hold her. On the removal of the family to Saybrook for the summer she began again to improve, and through most earnest entreaties the friends were kept from visiting her all summer, and in August she went to her home in Brooklyn perfectly well.

The entire change of scene from South Orange in winter to the Connecticut shore in summer has been of the greatest advantage to the patients.

They soon tire of a place, and often take a most unreasoning dislike to certain rooms, expressing a horror for them which they cannot explain, and the move has always resulted in a betterment of the mental condition of every one. The large grounds in Saybrook are very much enjoyed by all, and the opportunities for walking, sailing, driving, and wheeling make the summers most enjoyable.

Dr. Luther has no routine treatment, and when asked what she does to secure the recovery of so large a proportion of her patients (about 90 per cent.) she is unable to tell. The first step is to gain the confidence and love of the patient—it may take weeks to convince her that the doctor is her friend, and that her sole aim is to send her back to her friends well, but it is not time lost, and in the meantime each case is studied and treated as if it was the only case in the world.

When necessary Dr. Luther takes a patient into her own room and into her bed. For two years she had one of two patients with her every night, spending many hours in comforting them and allaying their fears. Both suffered from terror, and the work of reassuring them and quieting their fears at night was one which a nurse could not do, and the complete recovery of both more than repaid her for the trouble and loss of sleep.

From November to May, Dr. Luther's address is South Orange, N. J. The rest of the year it is Saybrook, Conn.

The Treatment of Pneumonia.

By MARY GREENWALD, M.D.,
STROUDSBURG, PA.

In this day of histological and pathological research, of Röntgen rays and hot-air treatment, and a thousand new discoveries and theories, the simple subject of the treatment of pneumonia may seem trite and out of place. But to me the subject of pneumonia has always been very interesting and its treatment highly important. During my hospital apprenticeship I learned to look with dread upon a case of pneumonia, for the mortality among the cases admitted to Blockley was very high. In spite of the most faithful attention from doctors and nurses one after another would die. Of course, the patients were almost always extremely ill when brought to the hospital, and they came from a class whose surroundings and habits had been such as to lessen their resisting powers to a great degree. They were almost all alcoholics, and that fact diminished their chances of recovery very much. High delirium seemed to be a marked feature in a majority of them. In private practice one finds a different condition of affairs prevailing, and soon learns that it is not necessarily a "losing fight" in which one engages, though it is usually a hard one.

Pneumonia, by which term we mean croupous pneumonia, has for quite a number of years been attributed to the action of the micrococcus lanceolatus or pneumococcus of Fränkel. The local effect is an inflammation of the lung substance, the different stages of which we all know, while the general effect produced by the toxins thrown out is manifested in the symptoms generally present, as rapid pulse, fever, delirium, and more or less marked prostration. Death from pneumonia is usually due to exhaustion of the vital forces, heart failure, or an intense toxæmia. In one's practice one often finds that pneumonia seems to be in some degree contagious, different members of the same family contracting the disease from each other, so that it has been recommended, and seems a reasonable plan to pursue, since pneumonia is a microbic disease, to use some simple precautions in order to prevent the communication of the disease. It is important that the patient should have perfect quiet and rest and an abundance of pure, fresh air, for, as the lung is partly incapacitated from performing

its function of aërating the blood, it is all the more essential that the air which does enter the lungs should contain its full proportion of oxygen. In the *Medical News* of November 26, 1898, there was a very interesting article by Andrew H. Smith, of New York, on the "Inhalation of Oxygen in Acute Affections of the Lungs." In it he speaks of the great value of inhalations of pure oxygen used comparatively early in the course of pneumonia. He shows that it is not simply to prevent asphyxiation that it should be used, but for the beneficial effect on the heart which becomes exhausted by the increased muscular effort necessary to propel the blood through the lung. And this, he says, is due not only to the obstruction of the vessels by the solidification of the lung, but also "to the sluggishness with which blood not duly aërated circulates even through unobstructed capillaries. The moment the oxygenation of the blood is improved the circulation becomes easier and the labor of the right heart is lightened." By employing it before the heart is so much exhausted, congestion of the unaffected part of the lung can be largely prevented and the condition of the patient much improved. He finds the indication for the employment of oxygen to be as soon as the respirations exceed thirty-five per minute and the lips assume a purple hue. Its good effects will be noted by lessened frequency of the pulse and respiration, a better color of the face and lips, and fewer moist râles in the chest.

As croupous pneumonia is a self-limited disease, it seems to be the opinion of most writers that the best method to treat it is to follow an expectant plan, seeing that the hygienic and dietetic conditions are right, and meeting symptoms as they arise. Thus there will be no fixed method of treating all cases, but each case will be treated according to its needs.

I have always been very much interested in the use of cold compresses and the ice-bag on the affected side, and wherever I have had the opportunity to use them have been more than pleased with the results obtained. As a means of reducing the temperature, relieving the nervous symptoms and steadying the heart, nothing can be more pleasant or effective. In children the method of applying cold compresses, advocated by Simon Baruch, of New York, is very beneficial. His plan is to make a compress of three thicknesses of old linen, cutting slits for the arms, so that it will fit snugly to the chest, and having wrung it out of water

of 65° or 70° F., envelop the chest on the affected side, and then cover it with flannel, renewing it every hour. He discontinues it when the temperature reaches 100° F.

In children under three he advises the use of the full bath, beginning with water at a temperature of 95° F. and gradually reducing it to 85° F., keeping up constantly a gentle friction of the body. The bath should be repeated every five or six hours, as long as the temperature is not less than 101° F. In the intervals between the baths he recommends a compress covering the entire anterior part of the chest, wrung out of water at 70° F., covered with flannel, and renewed every hour when the patient is not asleep.

Last spring I had a case of pneumonia which to my mind illustrated fully the value of cold applied to the chest. It was the fourth case I had had in the same family within eight months. Out of the four I lost one. The patient was a girl, aged about twenty-two years, who presented the typical symptoms of pneumonia: severe pain in the chest, chill, high fever, and rusty sputum. Her temperature during the first day ran up to 105$\frac{2}{5}$° F., and during the night she was quite delirious. Although the family were opposed, I applied an ice-bag to the head and chest, whereupon the temperature came down to 103$\frac{2}{5}$° F., where it stayed, with slight variations, until, at the request of the father, I removed the ice-bag, when it immediately began rising. I re-applied the ice-bag, and kept it there until the temperature began falling at the approach of the crisis. In spite of the fact that the whole right lung was almost completely consolidated and the patient was very weak, her pulse running as high as 146 and respirations 52 per minute, the temperature stayed below 103° F., tongue remained moist, and mind perfectly clear. Her brother, with scarcely any more involvement of the lung, was extremely delirious, and died about the eighth day of the disease. A very distressing symptom appeared in the girl's case about the sixth day of the disease. This was a most persistent hiccough, due, I suppose, to some irritation of the phrenic nerve. In this connection I may cite a similar case occurring at Blockley during my interneship there, in which the post-mortem revealed the phrenic nerve buried in a mass of exudates. This condition was extremely painful and weakening, even rousing her from her sleep. After trying various antispasmodics without any relief, I resorted to the hypoder-

matic use of atropin. sulph., gr. $\frac{1}{60}$, and nitroglycerin, gr. $\frac{1}{200}$, which relieved her for about six hours, when it returned, and atropin. sulph., gr. $\frac{1}{120}$, every three hours was prescribed by the mouth. On the second day after the crisis the patient complained of a severe sore throat. On examination, grayish-white patches were found covering the fauces. Temperature rose to 101° F. The throat was sprayed with hydrogen peroxide, but as the membrane was unquestionably diphtheritic, 2000 units of antitoxin were injected, and under its use the membrane soon disappeared. The temperature fell to normal, and the patient made a good recovery.

Among the drugs used in the treatment of pneumonia those which sustain the flagging heart seem to be most important. Strychnine is very useful. I have found small doses of digitalis and strophanthus combined not so difficult of toleration by the stomach as digitalis alone, and very helpful in sustaining the heart. When it becomes necessary to stimulate, the aromatic spirits of ammonia is often better than alcoholic stimulants, but it sometimes becomes necessary to resort to very free stimulation. Nitroglycerin is frequently used, as it dilates the peripheral bloodvessels, and thus relieves the heart. Almost all authors agree in condemning the use of depressing drugs even in the early stages of an attack; but I have seen cases which I am sure have been aborted by the prompt use of veratrum viride in the very beginning of the attack. It is sometimes quite puzzling to decide as to what line of treatment should be followed. In February of this year I was called to see an old lady. She was seventy-seven years of age, had carcinoma of the left breast, was very feeble, and almost sightless. She was taken with a very severe pain under the right scapula, and was unable to lie down or even move, could scarcely breathe. She had had a chill about 4 P.M., and when I saw her at 7 P.M., had a temperature of $103\frac{3}{5}$° F., with a very intermittent pulse, dropping every third beat, while normally it was quite full and regular. The sputum was rusty, but cough was slight. On examination I found an area of congestion at the base of the upper lobe of the right lung on its posterior aspect, fine crepitant râles being distinctly heard, also some dulness on percussion. In order to relieve the pains somewhat, I gave her a chlorodyne tablet and applied three dry cups to the congested area. I was afraid to use anything to depress the heart at her age, yet I felt sure that it

was the high temperature which was so disturbing the heart, and I knew that she could never live through an attack of pneumonia with the temperature running such a course. I was afraid, too, that she would not tolerate the ice-bag. I decided to try small doses of veratrum viride, staying myself to watch the effect, as we were unable to get a trained nurse that night. She took two minims of veratrum viride every hour from 7 P.M. to 12 A.M. At ten the fever was very high, bloodvessels throbbing in head and patient delirious. At eleven she began perspiring profusely, and the temperature had fallen to 101° F., pulse was much improved, dropping only one beat in twenty-four. At twelve I gave the last dose of veratrum and left, ordering her care-takers to begin at 1 A.M. with a mixture containing tr. strophanthus, ♏iij, and spts. etheris nit. ♏xv to the drachm, giving it every two hours. At 9 A.M. her temperature was normal, but she still complained of pain in the chest, and the physical signs persisted. She was cupped again. Continued the strophanthus mixture and poultices to the chest. Toward evening the temperature rose to 99.8° F., and from that time the disease ran a mild course, assuming more of a catarrhal type. The original patch became consolidated and spread anteriorly. There were scattered areas of consolidation at the base of the lung posteriorly and in the axilla. The cough was very slight and expectoration scanty. The temperature rose on the evening of the fourth day to 101° F., when the pulse again became very intermittent. It was due to a new invasion, but tepid sponging and an ice-cap to the head brought the temperature down to normal the next morning. It rose, however, to 99.4° F. in the evening, and varied between that and 100° F., being somewhat lower in the morning until the ninth day, when the crisis occurred. The condition of the pulse varied with the temperature, but was never above 100 in frequency. The treatment consisted of tr. strophanthus, ♏iij, tr. digitalis, ♏ij, every two or three hours; strych. sulph., gr. $\frac{1}{30}$, four times a day or every four hours, and spts. ammon. aromat., f℥ss to f℥j p. r. n. Poultices were applied to the chest as long as the patient complained of pain, and they seemed to give her great comfort and relief. I know they are condemned by many, but in cases like this they certainly seem useful. I have mentioned this case because I feel that the veratrum modified the course of the disease, yet it might have been influenced in some other way.

There still remains the antitoxin treatment of pneumonia to be discussed. In the October, 1898, number of the *American Journal of the Medical Sciences* there is an interesting article by Andrew H. Smith, who reviews the work done by Netter, Loa, and the Klemperer brothers in immunizing animals, and also curing them of pneumonia. He sums up their conclusions as follows: In man it is not the exudation in the lung that renders the disease so grave, but the general infection from the absorption of the bacterial poisons in the exudates into the circulation, acting on the heart and vital centres and producing febrile symptoms. In animals injected, the poison enters the blood-stream directly and produces fever at once. The poison increases for some days, and then the antitoxin is produced and immunity results. They conclude that from pneumotoxin in man is produced antitoxin at the time of the crisis, and this counteracts the effect of the toxins.

At the Academy of Medicine in Turin, in 1892, a number of physicians reported the results of treatment by the serum. In 1897, Washbourne, of Guy's Hospital, published his researches on the antipneumococcic serum. The conclusion seems to be that up to this time the results attained amount only to an encouragement to further efforts. Washbourne claimed that he could standardize his serum, and it is to be hoped that the time will speedily come when we can have as reliable and safe a method for treating pneumonia as we now have for the treatment of diphtheria.

DISCUSSION.

Dr. Thomas: My knowledge is confined to comparatively few cases. I am impressed with the necessity of understanding the patient, because the disease differs so materially with different people. In one case coming under my observation recently the consolidation was slight, with the subjective symptoms very marked. In another the consolidation covered the whole lung, and yet the subjective symptoms were not marked. I like the way Hare speaks with reference to the treatment. He says that we must watch all the time and resort to therapeusis only when necessary. We cannot watch these cases too carefully, and if we can keep them thoroughly nourished without having to give them many drugs we do a great deal for them; and when the indication arises we should not withhold drugs, but give enough to get results as quickly as possible.

I have never had an opportunity of using veratrum viride, but in looking over the subject I find the pendulum is coming to the centre more nearly, as also in the matter of venesection. A number advocate venesection if the case is seen early, or late in the disease if there is the highly pulsating

heart. I have never seen venesection used, but hope it will be brought up in the discussion. In my experience the cold treatment has been most favorable.

DR. RICHARDSON: Dr. Greenwald spoke of cold in the reduction of temperature. I would like to speak of it in the reduction of pain. I have had no cases in which the ice-bag has not removed the pain. The antitoxin treatment in diphtheria has so filled our hearts with comfort that I think we may expect great results in this direction. In applying the ice-pack I use the flat ice-cup; if that is not available, I take the hot-water bag and simply put it in a towel. I tell the nurse to apply it without the patient knowing it.

DR. CROASDALE: I have nothing to say except with reference to the treatment of pneumonia in the aged. I have been successful in the use of small doses of opiates, controlling the heart action and pain, and treating other symptoms as they arise.

DR. DERCUM: I have enjoyed Dr. Greenwald's paper very much, and wish to emphasize the fact of the contagiousness of pneumonia. A few years ago I had a patient suffering from grip, and she had been running into a neighbor's house where there were two cases of pneumonia who died within a few days of each other. My patient developed pneumonia, and a woman living in the same house came in to take care of her baby. She also developed pneumonia. I had them both isolated with a trained nurse. The mother of one of these patients insisted upon coming to the house. She was nearly eighty years of age. Although I advised her to keep away, the advice was not followed. She developed pneumonia and died. One patient recovered and is in good health. The other had apical pneumonia, and died one year ago of tuberculosis. Two weeks after this a man in the same house, sixty-two years of age, developed pneumonia and died. A little later, a child in the house developed acute croupous pneumonia following measles, and he recovered.

My experience in the treatment of the cases with cold has been very good in some cases. I mention these cases to emphasize the importance of isolation.

DR. PECK: It seems to me that in the treatment of fevers and other diseases we have a general principle to follow. So long as the pulse is good it seems best in many cases not to interfere. In that relation application of cold in pneumonia finds its place where the fever is harmful or where the toxins are being detrimental to the organism. The application of cold rests largely on the same basis as that which we adopt in typhoid fever; if the patient is bearing the fever well there is no need of application of cold, and we will not later find a general toxæmia. I remember the case of a child, four years old, in the West Philadelphia Hospital, with a severe attack of pneumonia lasting a long time. The temperature was 104° F., and the pulse higher. She was kept alive, I believe, by the use of the cold sheet. Her mental condition improved after the application of the cold. She behaved very much as a patient in a toxæmic state of fever under treatment of cold.

DR. PRESLEY: I have nothing to say except a word in favor of veratrum

viride. If anything will abort pneumonia when carefully used, that will do it, and a number of physicians whom I know are of the same opinion.

DR. LAKE: A country doctor has to use the means she has at hand and has to contrive a good many things, and I have found a fountain syringe a very good substitute for the ice-bag, letting the water run off into a pail. As applied to pneumonia, I have never dared to use cold. You have there to contend with the prejudices among people, and I am sure if you went into an ordinary house and recommended cold applications the family would send for another doctor immediately. I feel confident that I have shortened attacks of pneumonia when I have found it in the early stages by having the child wrapped in a blanket wrung out of warm salt water. That, with the internal use of veratrum viride, I have found of the greatest value in the treatment of pneumonia.

Perhaps along the coast we do not have pneumonia in such severe form as inland. I have never used digitalis until after the dangerous stage of pneumonia has passed.

DR. GOODWIN: I have been much interested in hearing Dr. Greenwald speak of the use of oxygen. I recall a case in which there was a decided hinderance to respiration. The temperature was high, pulse rapid, and there was decided cyanosis. The day was warm, and I was afraid the patient would die before the temperature changed, and I used oxygen in the way described by Dr. Greenwald. In twelve hours the patient's temperature fell to normal. The use of digitalin has also been very interesting to me. I have used digitalin rather than digitalis because of the effect on the stomach. In connection with the digitalin I have used nitroglycerin. Dr. Henry thinks we need to give the heart less work to do, and the combination of the drug seems to be very effectual in accomplishing this result. I was afterward interested in seeing a series of reports which showed the diminished blood-pressure, and, therefore, I thought that physiologically I had been wrong in using nitroglycerin. I would like to ask whether anyone has had experience in taking sphygmographic tracings under this treatment?

DR. EASBY: I remember a severe case of catarrhal pneumonia of both lungs. An old family physician was called in, and he recommended acetanilid, two grains and a half, with a small amount of quinine and a little powdered camphor, every two hours, and I never saw such a marked change in anyone. By continuing it the temperature was reduced to normal, and the patient after a long convalescence fully recovered. It has been such a help to me that I have used this prescription several times in cases of grip which have shown catarrhal condition of the lungs. I have always been afraid of these coal-tar products in anything so serious as pneumonia.

DR. GALBRAITH: If we can sustain the heart we can save our patient, and for that reason we should not wait until the patient gets into such a low condition before beginning stimulating treatment. In nitroglycerin we have one of our best respiratory stimulants, and this should be combined with strychnine, or strychnine and digitalis as the case may require. Oxygen should be introduced early in the treatment and be freely given.

In the application of cold we must always remember that children and

old people bear cold very badly. It may be used, but its use should only be kept up for a short time.

DR. GREENWALD (closing): I have been much interested in the discussion, because I have been much interested in pneumonia. I feel, as does Dr. Thomas, that it is a disease which needs most careful watching. I have never used the coal-tar products myself, because I have been afraid of the depressing effects, and I notice that most writers condemn their use, but practical experience will perhaps sustain one in using them.

I have been much interested in hearing of veratrum viride. If we can abort a disease it is so much better than to let it run on under the most skilful treatment. I remember one case in a boy, about thirteen years of age, in whom I am sure the disease was aborted. I saw him on the second day. The left lung was full of fine crepitous râles. He lived at a distance, and I could not see him very often, but still I ventured to leave the veratrum viride with his mother. I gave him three minims every three hours, and it produced a profuse perspiration and vomiting. The next day the temperature became normal and his appetite was good.

REPORT ON THE CASES OF TYPHOID FEVER TREATED IN THE WOMAN'S HOSPITAL DURING THE WINTER OF 1898–1899.

BY ELLA B. EVERITT, M.D.,
PHILADELPHIA.

FROM September 26, 1898, until the present time, seventy-eight cases of typhoid fever have been treated in the hospital, of which number sixty-four were soldiers, three were children and eleven were women. The men were all transferred to Philadelphia from Camp Meade, Pa., where they had been quartered for periods of from five weeks to three months. The other fourteen cases were all residents of Philadelphia, and had evidently contracted the disease here.

In dealing with the cases among the soldiers we labored under several disadvantages:

1. Little or no clinical history accompanied the men, many of whom could give but scanty information concerning the onset or duration of their illness.

2. The pressure of the immediate medical care of these patients, admitted as they were in all stages of the disease, was so great that the time for experimental work was very limited.

3. The clinical laboratory was not in full running order until January 1, 1899, hence investigations were somewhat irregular,

and considerable material had to be sent to the laboratory of the Board of Health, which was much overworked at that time.

Notwithstanding these difficulties, however, the collective study of the cases will, I trust, not be without interest.

The entire number of typhoids may be classified as follows :

	Men.	Per cent.	Women and Children.	Per cent.
Mild	28	44	3	21 3/7
Moderately severe	22	34	8	57 1/7
Severe	14	22	3	21 3/7
Total	64	100	14	100

Signs and Symptoms. In the majority of cases the onset was gradual. While chills or a single chill had occurred in three instances, the most common initial symptoms were severe backache and headache, with increasing lassitude as the disease progressed. Epistaxis occurred in 22 per cent., and diarrhœa was present in 63 per cent. of the cases. Delirium occurred at the height of the fever in 16 per cent., and in the majority of these was of an active, noisy type. The low muttering delirium commonly described was not typically displayed in any case among the soldiers, and in only two cases among the women.

The eruption of rose-colored maculæ was present in 78 per cent. of these patients ; in three moderate cases this phenomenon was very marked, the spots being distributed over the abdomen, chest, back and limbs. Sudamina appeared in five cases, and an erythematous rash in two.

The temperature-range was moderate, no case of hyperpyrexia having occurred. Chills and sweating occurred in six cases : in two at the beginning of the fever, as above stated, and in the others during convalescence. To this I shall refer later.

Enlargement of the spleen was observed in 50 per cent. of the cases recorded, but was not marked in any instance. Four patients complained of special splenic tenderness on pressure. Among the men distention of the abdomen was commonly absent, this symptom having been noteworthy in only six cases. Iliac tenderness also was slight, as a rule ; in fact, there was no male case presenting grave abdominal conditions. Among the women, however, there was marked tympany in three cases and excessive distention in one.

A typical relapse occurred in four cases and two relapses in each of two others. The duration of the shortest of these was ten days,

and of the longest twenty days. Several of the patients had recrudescence of the fever, which lasted but three or four days, and apparently was not due to further bacillary invasion.

The examination of the blood showed a steady fall in the number of red cells and the percentage of hæmoglobin during the attack and an absence of leucocytosis. The test for the Widal reaction was applied in sixty-three soldiers' cases, and a positive result obtained in 72 per cent. This large percentage of error is due chiefly to the fact that only four second trials were made, owing to the urgency of practical work. In cases reported upon negatively or as doubtful the clinical picture was complete, but the cases mild ones. The earliest specimens of blood were taken on the fifth day, and the reaction was present in one instance. The latest specimen was sent on the thirty-seventh day and the reaction was also obtained. The frequently repeated application of the Widal test to the cases among women and children gave positive reactions in all but one case, and in this a partial result was obtained.

The analysis of the urine showed albumin to be present in nine cases, and granular and fatty casts in one case. The diazo reaction was obtained in 63 per cent. of cases among the men, and in all the subsequent cases. It was first obtained on the fifth day (the earliest day represented) and latest on the thirtieth day in simple cases, later in relapses. Of the twenty-three cases in which the reaction was not obtained, nineteen were later than the fourteenth day, and only four were retested. In the majority of the cases where this reaction was obtained the temperature-range was from 101° to 102°, and rose-spots were present in 83 per cent.

Complications. Among the male patients no considerable intestinal hemorrhage occurred, and in only two cases was there even a small amount of blood in the discharge from the bowel. Four cases occurred among the women, two of which were very severe and prostrating. The complications of the circulatory system were phlebitis of the right femoral vein in one case, and purpura hemorrhagica in another case.

Respiratory complications included four cases of bronchopneumonia, two of lobar pneumonia and five of bronchitis. Among the women pulmonary complications were found in three cases, two of whom suffered from bronchopneumonia and one from lobar pneumonia.

In recounting the miscellaneous complications, that of a reformed alcoholic is especially worthy of mention. He had evidently a chronic hepatitis, and suffered from a severe acute exacerbation of this condition which threatened for a time to become suppurative, but which gradually subsided under the use of calomel and the continuous local application of the ice poultice, leaving him with the chronically enlarged liver with which he entered upon the febrile attack. There were in all cases treated five instances of the development of multiple subcutaneous abscesses. Bacteriological examination of the pus from these showed the staphylococcus pyogenes aureus in all cases and the bacillus pyocyaneus in one. Two cases of ulcerative stomatitis were observed, and one of otitis media. Gonorrhœal cystitis and urethritis recurred during convalescence in one case. Arthritis occurred in two cases, one involving the shoulder-joint, the other the metatarso-phalangeal joints of both feet.

Two of the women were pregnant when admitted to the hospital, in one case the diagnosis of incomplete abortion having been made outside. Upon her entrance there was every evidence of the existence of a typical attack of typhoid fever, which bore, undoubtedly, a causal relation to the occurrence of the abortion. She gave a history of having been ill for two weeks. Upon examination the uterus was found to be enlarged, the os dilated to the size of a silver dollar. The ovum, the size of a hen's egg, was removed entire and, after curettage, the uterus was packed with iodoform gauze. The patient made an uneventful recovery. The other case complicated similarly was a single colored woman, twenty-five years of age, who gave no history of pregnancy, but upon the twelfth day of the disease she had three uterine hemorrhages, and upon examination of the discharges a sac about the size of a one month's ovum was found in the clots. The uterus in this case also was dilated and curetted and a packing of iodoform gauze used. The patient's general condition was not satisfactory after the operation, hence saline injections were used per rectum and strong stimulation resorted to. Owing to the persistence of a very offensive discharge, on the fifth day after the first operation the uterus was again curetted and packed. During the afternoon of the same day the patient had a severe chill lasting fifteen minutes, following which the temperature rose to 104°, the pulse to 156, and the abdomen became greatly distended. After the adminis-

tration of calomel in divided doses and the constant application of ice-bags over the abdomen, these symptoms subsided promptly, the patient rested well during the night, and, with the exception of the development of an otitis media and a small superficial abscess, had no further hinderance to her convalescence.

Treatment. The plan of treatment adopted in this hospital during the residence of the men patients was sponging with ice-water or tepid water once in two hours, when the temperature was 102.5°, and tubbing once in three hours when the temperature reached 103.5° to 104°. Intestinal antiseptics were administered, among which were thymol, guaiacol carbonate, salol and sulpho-carbolate of zinc. Stimulants and tonics were used as indicated. The diet was milk or milk and lime-water where the bowels were loose ; milk, strained broth and beef-juice when the bowels were confined. The above-mentioned antiseptics were used in about an equal proportion of cases, and, according to our observation, the effects were about the same with all. Apparently the amount of gas formed in the bowels was restricted by their administration, and it was quite usual to find the abdomen even scaphoid after the first four or five days of treatment. The *duration* of the fever, however, was plainly uninfluenced by medication, and indeed all internal treatment was given rather to meet indications than with any idea of aborting or shortening the attack.

In the application of the cold bath by the tubbing method we regularly put the patient into the water at a temperature of 90°, gradually reducing this to 70° or 65°, according to the effect upon the patient. Friction was kept up during the entire time of the bath and the patient was returned to bed without drying.

In the cases of the women coming after the above group we adopted the use of the ice-coil in all but two cases, and in those we used ice-bags over the entire abdomen. The apparent effect of these local applications of ice was to partially control the temperature and greatly lessen the necessity for baths either by the sponging or the tubbing method.

Results. Sixty-two of the sixty-four soldiers recovered ; two deaths occurred, the result of lobar pneumonia contracted from exposure while suffering from the original fever. The organism found in the expectorations was the diplococcus pneumoniæ. One fatal case occurred among the women, death being due to the

same complication, the same organism having been found to be abundant in the expectoration.

A few cases are worthy of special note before closing this report. As we had observed the occurrence of chills in several cases, the existence of mixed infection with the typhoid bacillus and the plasmodium of malaria was suspected. Accordingly, numerous examinations of the blood were made, with a view to determining whether the suspicions were well founded. All gave unmistakably the Widal reaction, and could without question be classified as typhoid fever subjects. A brief account of these is as follows :

CASE I. was admitted on the tenth day of the fever and ran an uninterrupted course of typhoid for eleven days, after which the morning temperature became normal or subnormal. On the twenty-second day he had a chill followed by rise of temperature to 104°, which was followed by sweating. From this point the temperature gradually declined ; was quite normal again on the twenty-fifth day, and so remained until the twenty-ninth day, seven days subsequent to the first chill, when the same sequence of symptoms occurred, the chill being followed by a rise of temperature to 105° with the subsequent sweat and decline of fever. On the thirty-sixth day, seven days after the second attack, the temperature again rose to 102°, but no chill was experienced. The examination of the blood in this case did not at any time show the malarial organism, but after the administration of quinine and Fowler's solution there was no return of the periodic paroxysm. The recurrence of these manifestations at regular intervals of seven days, together with the response to the therapeutic test, seemed to warrant the diagnosis of malarial poisoning.

CASE II. was convalescent from typhoid fever after a run of twenty-eight days, when he had a marked chill, and the temperature rose to 103°. On the third day thereafter the same symptoms were manifested, but the blood in daily examinations at this time failed to reveal the malarial organism. After the administration of quinine there was no reappearance of the symptoms. The tentative diagnosis of malaria was made here also.

CASE III. was admitted on the eighth day of the disease, and on the day following his admission—*i. e.*, the ninth day of the disease—had chill, fever and sweat. On the eleventh day the chill recurred, and again on the sixteenth and nineteenth days. On the twentieth day the plasmodium malariæ was obtained from the

blood. This was the only case in which the organism was distinctly demonstrated, and in this case the two diseases were apparently active simultaneously. It will be noticed that the malarial manifestations in the other two cases appeared upon the decline of the typhoid fever. Several other cases suggested malarial developments at the later stage, but were not sufficiently pronounced to warrant a diagnosis of malaria.

Before a careful study of the records had been made the general impression produced was that the malarial organism appeared to be held in abeyance while the typhoid poison was active, and that upon the subsidence of the fever, due to the latter, the former manifested itself, and in the majority of the cases this seems to be true. But in the one case where the conclusive proof of the malarial infection was forthcoming the two diseases were, as I have said, running simultaneously ; hence there is no positive inhibitory effect of the typhoid toxins upon the malarial organism.

The reports of the cases of typhoid fever among the soldiers cared for in other hospitals show that similar observations have been made elsewhere. Dr. James Ewing, reporting upon a large number of cases tested at Camp Wyckoff, draws the following conclusions :

" 1. Mixed infection of typhoid fever and malaria undoubtedly exists. 2. When typhoid develops in a case of active malaria the malarial element nearly always becomes quiescent and has little or no effect on the course of the typhoid fever. 3. Malarial infection frequently outlasts the typhoid infection and makes itself manifest during convalescence."

Dr. William H. Park has reported that inquiry among the hospitals of New York City elicits the fact that " in all but one hospital the malarial organism had been found in the blood of from 1 to 5 per cent. of the typhoid fever cases."

In considering the groups as a whole we have observed that by far the most severe cases have been among the women, the composite clinical picture which they make being one of far greater seriousness than that presented by the men. While in a few instances the complications of the disease produced grave conditions, the essential symptoms of enteric fever were not of severe grade among the soldiers. On the other hand, several uncomplicated cases among the women ran on to the most severe forms

in which the disease appears, threatening life *per se* rather than by complications.

In common with other hospitals which cared for the soldiers, the mortality-rate among this class of patients was exceptionally low, in this institution being $3\frac{1}{6}$ per cent., and the mortality in all cases treated being $4\frac{7}{10}$ per cent. We are glad, therefore, to have shared in the care of a series of cases which made a record for a lower mortality-rate than had heretofore been obtained in the treatment of this disease.

Notes on the Diagnosis and Treatment of Typhoid Fever.

By MARY H. COTTON, M.D.,
NEW YORK CITY.

It is probably true that for the last two years no disease has been more discussed in medical societies or written about in medical journals than typhoid fever.

The etiology, prophylaxis, diagnosis and treatment have all had equal places in this discussion, and, in consideration of the number of cases of typhoid fever throughout the whole country, almost epidemic in character, these discussions and papers have been fully warranted. The subject is so vast and so full of interest in its every aspect, and of such vital importance to us, as physicians, that hours and days could well be consumed in its consideration. I shall limit myself, however, to the presentation of but two phases of the subject: the *diagnosis* and the *treatment* of typhoid fever—the *diagnosis* as aided by the new tests, the *Widal* and *diazo reactions*, and the *treatment* to the *antiseptic* and *eliminative* methods.

An early and positive diagnosis of typhoid fever has long been desired and attempted, and there is no disease in which, in severe cases, such a diagnosis is more difficult to make when one is dependent solely upon the symptomatology. The importance of an early diagnosis is unquestioned, both on account of the prognosis and the treatment, enabling one to place the patient at once on the most favorable basis for a speedy and happy termination of the disease.

Of late years the attempt has been made to obtain some other means of diagnosis than that dependent upon the symptoms and course of the disease, and the two tests that have been found to be the most reliable are the Widal and diazo reactions.

In June, 1896, Widal published a communication in *La Semaine Médicale* announcing the fact that the blood serum of persons ill with typhoid fever exercises a peculiar influence upon recent broth cultures of the typhoid bacillus, and recommending this method as a means of diagnosis.

This fact had already been observed by Pfeiffer, Grüber and others in connection with cholera-vibrion and typhoid bacillus; but Widal was the first to make practical application of the test on an extensive scale.

Widal describes the phenomena as follows: "Several bouillon-tubes are separately inoculated with the typhoid bacillus and the bacillus coli communis. A few drops of the serum of an animal thoroughly immunized against typhoid infection are added to each of these, and they are then placed in an incubator at 37° C. In four or five hours the tubes containing the bacillus coli communis begin to become cloudy, while the tubes inoculated with the typhoid bacillus remain almost entirely clear. At the end of twenty-four hours the tubes with the bacillus coli communis have become intensely cloudy throughout, while those containing the typhoid bacillus remain clear or are but slightly cloudy, the microbes in these tubes having been precipitated as whitish flakes on the bottom.

"A drop of the culture of the bacillus coli examined microscopically shows isolated bacteria, for the most part actively motile. A drop of the culture of the typhoid bacillus, on the other hand, when examined microscopically, presents only scattered agglomerations of bacteria which are immotile, deformed, thickened, and agglutinated together. No isolated or motile bacteria are to be seen. The formation of a precipitate visible to the naked eye, and (microscopically) the immobilization, agglutination, and deformity of the microbes are characteristics of the phenomenon."

Widal states that he failed to obtain this reaction but once in 177 cases, whose subsequent history confirmed the diagnosis of typhoid.

In October, 1896, the Health Board of New York City announced to the physicians of that city that the board was prepared to receive specimens of the blood of patients with suspected typhoid for diagnosis, and arrangements were made so that physicians could obtain glass-slides with slideholders, circulars of information and blanks to be filled out, from various health depots throughout the city. After the preparation of the specimens they were returned to the depot and collected the same day by the employés of the board. Physicians received the report of the tests the next day. In 108 cases in which after the completion of the illness a definite diagnosis of typhoid fever was made by the physician in charge, a marked immediate reaction occurred at the first test in 75. The possibility that some of the cases giving no reaction and considered as typhoid fever by the physician in attendance may not have had typhoid must be taken into consideration. It is really not so important whether the reaction is present in 70, 80, or 90 per cent. of cases upon first examination as that occasionally or frequently it is altogether absent.

The majority of the cases that give no reaction by the fourteenth day failed to give at any time a definite reaction.

In 422 cases of typical or suspected typhoid reported by various experimenters, the reaction was positive in 312, partial or feeble in 6 ; the negative reaction was confirmed in 92 cases, and in but 12 cases was the reaction negative when the subsequent history confirmed the diagnosis of typhoid fever.

As made by the New York Board of Health the test is performed as follows : The blood is obtained by pricking with a needle the end of the finger after it has been thoroughly cleansed. Two drops are placed upon a glass slide which is allowed to dry. After drying, the slide is placed in the holder and sent to the laboratory. In preparing the specimen for examination the dried blood is mixed with five times the quantity of water. A drop of the mixture is placed on the cover-glass and to it is added a drop of a fifteen to twenty-hour bouillon culture of the typhoid bacillus. The cover-glass is inverted over a hollow slide (the edges being smeared with oil or vaseline to make a closed chamber), and the hanging drop is examined under the microscope, preferably by gas-light, a high-power lens (one-sixth) being used. If the reaction takes place rapidly, the microscope reveals at once

the completed reaction, all the bacilli being in loose clumps, and nearly or altogether motionless. Between the clumps are clear spaces containing few or no isolated bacilli.

If the reaction is less complete, a few bacilli may be found "moving slowly between the clumps in an aimless way, while others, attached to the clumps by an end, are apparently trying to pull away, much as a fly caught on fly-paper struggles for freedom." According to the completeness of the reaction, either all the bacilli may finally become clumped and immobilized or only a small portion of them, the rest remaining freely motile.

If too concentrated a solution of dried blood from a healthy person is employed, there will be immobilizing of the bacilli but no true clumping.

The reaction, however, is not a qualitative test, but a quantitative one, hence the degree of dilution is of great importance.

Widal himself adopted a dilution of 1 : 10 with better results in cases of true typhoid fever, but without eliminating erroneous conclusions in others.

It has been concluded by later observers that a "dilution of 1 : 50 will generally afford positive indications within the first and always during the second week, the energy increasing with the progress of the disease. The serum retains this property for many months or years, in fact so long as immunity, with which it is in some way connected, persists. Apparently positive results are afforded in a certain proportion of febrile cases other than enteric, but this only occurs when the serum is comparatively concentrated, and never in dilution of 1 : 30 or more."

Dr. Schabad, of Wilna, as a result of extensive hospital experience, draws the following conclusions: 1. In the hands of an expert and with an active culture the Widal reaction is a very useful aid in the diagnosis or exclusion of typhoid fever. 2. A marked or medium positive reaction, which is seen microscopically with a 1 : 50 dilution, speaks for typhoid fever; a medium and absolutely negative one, against the disease. The macroscopic negative reaction does not, however, exclude typhoid. 3. The severity of the disease at times influences the intensity of the reaction, but particularly the duration of the same. 4. The positive reaction may appear five or six days after the beginning of the disease, and may exist one year after convalescence. 5. Instead of using blood and blood serum the same results may be obtained

by using the serous exudation from bullæ. 6. The examination of the urine in accordance with the principle of Widal does not give satisfactory results. 7. For diagnostic purposes formalin cultures may be used in the places of fresh ones. 8. The existence of unclassified forms of typhoid must be looked upon as doubtful. There are in all likelihood infectious diseases which run a course similar to typhoid, the nature of which is not yet thoroughly understood.

Dr. W. H. Welch, of Baltimore, considers the serum diagnosis of typhoid fever of great practical value. He attributes this reaction to an alteration of the blood resulting from a specific effect of infection, or intoxication with typhoid bacillus. Dr. Welch prefers the microscopical method to the macroscopical, and he emphasizes the importance of quantitative determinations, relating especially to the culture, the time limits, and the dilution of the serum. He thinks that the danger of mistakes from positive reaction in non-typhoid cases can be guarded against in nearly all instances.

There are two drawbacks that tend to prevent this serum test becoming the ideal method of diagnosing typhoid fever: 1. It is often absent in the early days of the disease. 2. It is not a test that can be readily performed by the general practitioner. Those physicians who live in the cities where the health board conducts such tests can readily avail themselves of this aid to diagnosis. But to physicians who are dependent upon their own time and skill and apparatus for the performance of such tests it is not so satisfactory.

(I am much indebted to an article in the *American Journal of the Medical Sciences*, by Drs. Biggs and Park, for valuable aid on the serum test for typhoid fever.)

The diazo reaction, which we will next consider, is, on the other hand, simple of performance, requires little apparatus, and can be readily performed by the busy practitioner. Ehrlich, in 1892, was the first to call attention to this reaction of the urine, and since then it has been employed and his results verified by many experimenters.

Tyson, in his *Practice of Medicine*, says that it is so constant in typhoid as to be deservedly regarded as a symptom. He says that he has never found it absent when the test was made sufficiently early.

According to Tyson the test is made as follows: Three solutions are kept in separate bottles: 1. A 5 per cent. solution of hydrochloric acid saturated with sulphanilic acid. This solution should be fresh. 2. A ½ per cent. solution of sodium nitrite. 3. Ammonium hydrate.

To make the test, 40 c.c. of 1 and 1 c.c. of 2 are mixed. "The hydrochloric acid acting on the sodium nitrite liberates nitrous acid, which in its nascent state combines with the sulphanilic acid, producing diazo-benzine-sulphonic acid. Equal parts of this mixed solution and urine are thoroughly shaken; enough of the ammonia is then allowed to flow down the side of the tube to form a colorless zone above the urine mixture. At the junction of the two fluids a dark garnet or cherry-red ring will form if the reaction takes place, and if the tube is well shaken a uniform red color is imparted to the entire fluid, which, when allowed to stand for some hours, shows a characteristic olive-green precipitate, the upper layer of which, as a rule, has a still darker green color."

As a result of upward of 3000 observations in 250 cases of various disorders, Jez has arrived at the conclusion that the diazo reaction is due to toxic substances generated by the typhoid bacillus (typhotoxins), altered in some way in their passage through the human organism. He states that he finds it on the second to the seventh day of the disease, with constancy, and that it is of a good deal of prognostic significance, its intensity varying directly with the severity of the morbid process. In cases in which the diagnosis is doubtful as between typhoid fever and gastric fever, acute gastro-enteritis or malarial fever, the reaction is of a diagnostic import, as it does not appear in the course of any of the diseases. In doubtful cases, in which the reaction fails to appear, typhoid fever is to be diagnosticated with great caution.

Dr. Charles Lyman Greene finds the diazo reaction in 95 per cent. of his cases, and while he does not consider it a pathognomonic sign, yet he says that he finds it a constant sign and a very early one.

Dr. Umikow, as a result of an extensive experience, arrives at the following conclusions: 1. The diazo reaction never appears in the urine of healthy individuals. 2. High fever has no influence upon the occurrence of this reaction. 3. Acute and chronic catarrhal pneumonia run their course without the presence of the diazo reaction in the urine. The reaction is also wanting in

diphtheria, varicella, otitis media, coryza, facial eczema, lymphangitis, hereditary syphilis, laryngitis, bronchitis, pleuritis, enteritis, and erythema after the injection of diphtheria antitoxin. 4. Erysipelas and measles practically always give the diazo reaction in the urine, and more distinctly the greater the severity of the disease.

On account, therefore, of its simplicity of execution and the great diagnostic and prognostic significance, this test should never be omitted in cases of suspected typhoid fever. I am in the habit of employing the diazo reaction in all such cases where the diagnosis is at all doubtful, and, in fact, in all cases that I suspect may be typhoid. I have made the test of the urine of twenty different patients, and with but one exception the reaction was positive in all cases that subsequently gave a history of typhoid. This case was seen late in the disease, and while undoubtedly typhoid he was convalescent.

I have found the urine to respond to the test as early as the second day of illness. In all my cases I make the test as soon as called to see the patient, and I have not failed to find it at this early period in a single case. I found the reaction in the urine of one patient as late as one year after the attack of the fever.

The diazo test is so simple in its performance, and while it is not pathognomonic, yet it is of such diagnostic and prognostic value, that I feel that it should not be neglected in a single case of suspected typhoid fever.

Let us turn now from the contemplation of these two new aids in the diagnosis of typhoid to the treatment of the disease. Dr. Henshow, in the *Boston Medical and Surgical Journal*, May 14, 1896, commences an article as follows: "Within the past few years more than fifteen hundred remedies have been suggested for the treatment and cure of typhoid fever. All sorts and kinds of food have been advocated as of special value in the diet; hydrotherapy and antipyretics have been advised for the reduction of the fever; attention has been called to the value of intestinal antisepsis; while the symptoms during the course of the disease have been relieved, experimentally, at least, by almost every resource of the pharmacopœia."

I shall, however, confine myself to a consideration of the eliminative and antiseptic methods of treatment. The idea of an antiseptic treatment of typhoid fever has long been in the minds of practical physicians, as the writings of Murchison, Watson,

Jenner, and others show. "But this growing knowledge of the manner in which pathogenic microbes infect the organism, and the evidence that has recently been forthcoming, that their toxic effect may be antagonized by remedial measures, have given a remarkable impulse to the application of the antiseptic idea in the treatment of these maladies which are distinctly traceable to the invasion of the human body by such organisms; and what is known of the nature of the characteristic lesions of typhoid fever simply imposes upon us, as an imperative duty, the necessity of adopting a method of treatment which will include as an essential part of it the attempt to realize intestinal antisepsis.

"In the small intestines, especially, the influence of the specific infective bacillus in setting up serious structural changes, often leading to fatal consequences, is well known; and it seems probable that these consequences may be contributed to in a notable degree by a loss of power of resistance in the specifically diseased tissues to the attack of non-specific putrefactive micro-organisms which are always present in the intestinal canal, so that intestinal antisepsis is as much needed to counteract the local injurious influence of non-specific as of specific micro-organisms. But we also know that the activities of the typhoid bacillus are not limited to the intestine, but that it passes through the walls of the intestine into the blood and is always to be found in that of the spleen. An antiseptic action on the blood is therefore indicated."

The following antiseptics have been recommended for use in the treatment of typhoid fever: quinine, chlorine, iodoform, calomel, iodine, carbolic acid, sulpho-carbolates, creosote, sulphurous acid, salol, bismuth salicylate, turpentine, oil of eucalyptus, thymol, the naphthols and naphthaline, camphor, resorcin, guaiacol, etc.

I. Burney Yeo treats his typhoid fever patients with great success by means of small doses of quinine and chlorine gas in solution. I will not enter into the method of preparing the chlorines. The quinine is given dissolved in citric acid and combined with an alkali to cause effervescence.

Dr. Richard C. Newton, in an article in the *Medical Record* of December 19, 1896, after considering the different methods of antiseptic treatment, recommended very highly the chlorine water suggested by Yeo. I used this treatment in one case, but the patient's stomach rebelled against the chlorine water, and I had to change to other means of antisepsis.

Yeo claims for the treatment: 1. A modification and sustained depression of the febrile temperature. 2. An abbreviation of the average course of the fever. 3. A remarkable maintenance of the physical strength and intellectual clearness of the patient, so that there is far less need of stimulants. 4. A greater power of assimilating food. 5. A remarkable cleaning of the tongue. 6. A deodorization of the evacuations. 7. A more rapid and complete convalescence.

Dr. W. B. Thistle, of Toronto, Canada, brought forward in 1893 a plan of treatment which he designates as the "eliminative and antiseptic treatment" of typhoid fever. This treatment consists in the elimination of purgative medicines that shall act on the upper and small intestine, and recommends for this purpose calomel and salines especially. He gives the calomel in several doses of one-half to one grain, followed in several hours by magnesium sulphate or Rochelle salts in half-ounce doses. With the purgatives he associates as an antiseptic salol in ten-grain doses every three or four hours. To compensate for the withdrawal from the body of such large quantities of water, and to dilute the toxins in the blood and flush the kidneys, he advises the ingestion of large quantities of water. Dr. Thistle summarizes the use of purgatives in typhoid fever and the purpose of the eliminative plan as follows:

1. To limit the original infection and intoxication of the system generally.

2. To carry away the toxic bile as it is poured into the intestine.

3. To promote elimination through the medium of the serous exudate into the intestine.

4. To promote excretion of the toxins by the kidneys.

5. By lessening the toxæmia to increase the resistance and aggressive action of the tissues.

6. To prevent excessive accumulation of bacilli (typhoid bacilli, colon bacilli, etc.) and toxins in the intestinal glands, thus lessening the likelihood of extensive necrosis and ulceration and the dangers incidental to that condition.

7. By maintaining the intestine as free as possible from bacilli and toxins and frequently clearing it out to lessen the work thrown on the liver from the portal side, and thus enable it to exercise its depurative function more fully in the interception of poisons in the general circulation.

8. To lessen the chance of death from exhaustion due to the long-continued action of large quantities of poison on the tissues.

9. To lessen the amount of poison in the body and avert the danger of death from excessive accumulation of toxin—*i. e.*, acute toxæmia.

10. To prevent the discomfort and danger arising from accumulation of gases in the intestine.

11. To prevent or control diarrhœa. Whether the diarrhœal flux be due to bacilli or irritant matter in the intestine, or is the physiological result of toxic substances in the system; in either case the action of the purgatives would be beneficial. In one case the irritants, whatever their nature, are removed; in the other the systemic toxæmia is lessened.

12. By keeping toxæmia at the lowest possible point, the functions of digestion and assimilation are less interfered with and nutrition is better sustained.

Dr. John Eliot Woodbridge, of Cleveland, Ohio, offers to the inquiring physician an "abortive treatment" of typhoid fever. He also claims not only to minimize the dangers and complications of typhoid and to lower the death-rate, but to abort the disease itself.

His treatment is as follows. For the first twenty-four hours he gives one tablet, every fifteen minutes, consisting of the following ingredients:

℞.—Podophyllin	gr. $^1/_{960}$
Hyd. chlor. nit.	gr. $^1/_{16}$
Guaiacol carb.	gr. $^1/_{16}$
Menthol	gr. $^1/_{16}$
Eucalyptol	♏ j.

"At the end of the first day, if these are well borne and the bowels have not moved too freely, two No. 2 tablets are to be given every hour alternately with two No. 1, so that the medicine is given every half hour."

No. 2 tablets contain the same ingredients as No. 1, with the addition of thymol, gr. $\frac{1}{16}$, and the guaiacol is increased to gr. $\frac{1}{4}$.

℞.—Podophyllin	gr. $^1/_{960}$
Hyd. chlor. nit.	gr. $^1/_{16}$
Guaiacol carb.	gr. $^1/_4$
Menthol	gr. $^1/_{16}$
Thymol	gr. $^1/_{16}$
Eucalyptol	♏ j.

"If five or six evacuations occur during the second twenty-four hours the intervals can be lengthened between the dose. After three days capsule No. 3 is given, one every three hours, between which the tablets, mostly No. 2, are given, according to the effect to be maintained upon the bowels."

Capsule No. 3 contains:

℞.—Guaiacol carb.	. . . . .	gr. iij.
Thymol	. . . . .	gr. j.
Menthol	. . . . .	gr. ss.
Eucalyptol	. . . . .	♏ v.

With this method of treatment Dr. Woodbridge claims a death-rate of but 1.88, reporting 8434 cases of typhoid fever with 150 deaths. Dr. Woodbridge objects to the treatment being modified in any way as to frequency of dose, etc., and if done declines to consider it the abortive treatment.

Practical physicians all over the world agree that the initial treatment of typhoid fever should be some cathartic—calomel is preferred by the majority—but the subsequent treatment differs radically, from no medication whatever to the administration of tablets every fifteen minutes.

Of tubbing and the Brand treatment I will not speak in this paper. Suffice it to say that while we acknowledge the stimulating and antipyretic effect of cold baths, yet in many cases they do not seem practicable. Dr. W. Gilman Thompson states that each bath costs $2.50, and when we consider the limited means of many patients there is an added difficulty to carrying out the Brand treatment. Cold or tepid sponging should be used and used frequently for the comfort of the patient as well as for the reduction of temperature.

In my own practice, whenever I suspect a case of typhoid fever, I am in the habit of beginning the treatment with small doses of calomel, $\frac{1}{8}$ to $\frac{1}{4}$ gr. every one to two hours, followed if necessary by a saline. In the meantime I test the urine for the diazo reaction. If it is negative, I continue the calomel and add quinine for a day or two. However, I have never failed to obtain a reaction at my first test in cases of typhoid. If the diazo reaction is positive, I follow the calomel with tablets No. 1 of Dr. Woodbridge's formula, but less frequently, giving two every half-hour or hour. For children smaller tablets are made. In my earlier

practice I was in the habit of using hydrochloric acid with iodine and carbolic acid for antiseptics, but these are more irritating to the stomach than thymol and guaiacol, and instead of using turpentine, or waiting for the indication for its use, I prefer eucalyptol. In this way the intestines are kept free of septic material, the toxins eliminated from the system, the temperature lowered, the danger of complication lessened, and the disease curtailed.

I have no doubt but that many cases are much prolonged by the absorption and resorption of toxins from the intestines long after the specific bacillus of the disease has been controlled. I have in mind two cases of this type ; both cases were exceedingly constipated, and while care was used that their bowels were evacuated every day or every other day by means of enemata, the small intestine was probably not cleared at all.

CASE I.—Miss A., aged twenty-seven years, went to bed May 7, 1896, with a temperature of 101° F. O May 12th her temperature reached 103° F., and began to fall, to rise again to 103.6° F. on July 2d. This case was not dismissed until August 13th, after ninety-eight days of illness. She was on milk diet throughout, was bright all the time, did not seem much sick, but her temperature would not remain normal. There were no complications except a slight cystitis.

Similar tedious cases were reported all over the country at the same time, and they were especially prevalent throughout Ohio. I remember reading in the *New York Medical Record* of one case in that city lasting nearly a year, in the practice of a prominent physician whose name has slipped my mind.

In Case I. the treatment was supportive: hydrochloric acid, quinine, iodine, and carbolic acid. I tried the chlorine water, but it was extremely disagreeable to the patient and irritated her stomach. This case occurred in my own family, and I was more impressed than ever by the lack of a scientific and satisfactory treatment of typhoid fever. I felt all the time that free evacuations of the bowels should be obtained, but all the authorities said not to give purgatives by the mouth after the first week. I obtained the diazo reaction in the urine of this patient one year after recovery.

CASE II.—Mrs. W. Q. A., aged sixty-four years. I was called in consultation to see this patient November 23, 1898. She was taken ill November 2d, and on November 16th her temper-

ature reached 103.4° F. This case gives the same history of a long, tedious illness, but more severe in type. At times she was delirious, and much of the time somnolent. Recovery, however, ensued, notwithstanding her extreme prostration, and the case was dismissed January 24, 1899, the eighty-fourth day of the illness. In this case there was the marked constipation, and without doubt reinfection by absorption from the intestines of toxic material. The treatment was supportive and symptomatic.

In contrast to these two cases, which are typical of many others occurring in the last few years, let me give you the histories of five others treated by antiseptics and eliminatives.

CASE III.—R. A., aged eight years, was taken sick April 1, 1897, with vomiting and diarrhœa and a temperature of 100.2° F. He was placed at once on calomel, gr. ⅛, every hour for the first twelve hours. The urine was tested for the diazo reaction, and a positive reaction obtained. On the second day Woodbridge's tablets No. 2 were substituted for the calomel, one every hour. On the sixth day tablet No. 5, similar to No. 3, but smaller, was given, one every three hours, alternating with No. 2. His temperature began dropping below normal on the fourteenth day of sickness, when he became convalescent.

CASE IV.—M. A., aged fifteen years. The history of this case is almost identical with the preceding case, No. 3, whose sister she is. She was taken sick April 16th with nausea, vomiting, diarrhœa, and a temperature of 99.5° F. She was placed at once on calomel, gr. ⅛, every hour. The diazo reaction was obtained the next day, when she was given Woodbridge's tablet No. 2 every hour. On the fourth day she was given tablet No. 3 every three hours in addition. Further treatment consisted in potassium bromide for sleeplessness, and phenacetin when her temperature went up to 103.4.° F. on the fourth day, and when it rose above 103° F. A single dose combined with sponging was very satisfactory in reducing the temperature. The diazo reaction was more marked on the fourth day of illness. The temperature went below normal on the sixteenth day, and did not rise above after that date. Both of these cases were marked by their lack of complications of any kind, and after the vomiting and diarrhœa were controlled the temperature was the sole index of the progress and existence of the disease.

CASE V.—E. B., aged seventeen years. I found this patient

exceedingly ill when I was first called, April 8, 1897. There was extreme prostration, fainting at times, almost uncontrollable vomiting, and the case looked rather hopeless. She gave a history of being sick for several days, with vomiting and diarrhœa. Her temperature was 100° F., which rose next day to 104° F. I at once put her on small doses of calomel, ice for vomiting; diet, milk and ice-cream. I obtained the diazo reaction when the test was made the next day. Her stomach was extremely irritable throughout her illness, and her diet was buttermilk supplemented by liquid peptonoids. She could not take the Woodbridge capsules, and I made a mixture containing the various antiseptics instead. Her temperature began to fall at once, and dropped below normal on the eighth day after I was called, being, however, probably the twelfth to fourteenth day of the fever. After the twelfth day her temperature did not rise above normal.

CASE VI.—Mrs. P., aged fifty-five years. This patient was first seen February 11, 1899. She gave a history of not feeling well all winter, had no appetite, stomach was irritable. She was much run down and in a bad condition to withstand the attack of a prolonged and severe fever. Her temperature was 101.4° F.; she was vomiting, had diarrhœa, thought she had had fever for a number of days. The diazo reaction was obtained in the urine. She was given calomel every hour, and Fairchild's panopepton, one-half ounce, every three hours. She could not retain much milk for several days, but after that was able to take it. The calomel was followed by Woodbridge's capsule No. 3, not giving the No. 2, for I wanted the larger amounts of the antiseptics, and her stomach rebelled against much medicine. Her tongue began to clean at once, and her temperature reached normal on February 17th, the seventh day after the treatment was begun, and her tongue was entirely cleaned by the next day. Her convalescence was uneventful aside from her irritable stomach.

CASE VII.—H. T., aged four years, is the last case that I shall present. I was called in consultation February 8, 1899, and found a very sick patient. He was taken sick on the 4th with vomiting, diarrhœa, and high fever. When I saw him four days later he was much prostrated, was vomiting, had frequent watery stools, was somnolent, and at times delirious. There was muscular tremor and carphalogia. I suggested the use of calomel in small doses and various antiseptics. He was unable to swallow tablets,

and was given a mixture containing thymol, guaiacol, eucalyptol, and boric acid. His milk was sterilized and partially peptonized. While the temperature was slow in falling, yet there was a steady gain in strength and improvement in the mental condition ; his tongue cleaned, the diarrhœa ceased, and his stools became more normal in character. His highest temperature was 103.4° F. on the fifth day of the disease, and again on the fourteenth. His temperature did not drop below normal till the twenty-fourth day, but considering the severity of the attack, especially at the very outset of the disease, and the fact that he was stronger and in better condition after two weeks of illness than during the first week, we cannot but feel that the case was benefited and improved by the antiseptic treatment.

TEMPERATURE-CHARTS.

Days.	Case III. (April 1-16, 1897)		Case IV. (Apr.16-May 2, 1897)		Case V. (April 8-19, 1897)		Case VI. (Feb. 11-25, 1899)	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
1 . . .	100.2°	.....	99.5°	99.2°	100.0°	104.0°	98.4°	101.5°
2 . . .	99.0	100.2°	101.3	100.6	102.0	102.0	99.4	101.4
3 . . .	99.3	101.2	99.6	102.0	99.4	100.2	99.8	100.5
4 . . .	100.0	99.6	102.0	103.4	99.0	100.4	100.5	99.8
5 . . .	99.8	102.6	102.0	102.0	100.4	99.2	100.4	100.4
6 . . .	99.4	100.4	101.0	102.8	99.	101.8	99.4	100.8
7 . . .	101.0	101.7	101.6	102.0	98.6	99.6	98.4	100.2
8 . . .	99.7	102.4	100.0	103.4	98.2	99.4	98.8	99.2
9 . . .	100.7	103.1	100.6	103.3	98.0	99.4	98.4	99.0
10 . . .	100.2	100.7	101.4	102.5	97.0	99.0	98.4	98.8
11 . . .	100.0	101.8	100.0	102.4	96.0	98.7	97.8	98.4
12 . . .	99.4	102.5	99.2	101.2	97.0	98.3	98.	98.0
13 . . .	98.7	101.2	99.8	100.2	.....	.....	97.8	98.6
14 . . .	98.	100.0	99.8	99.6	.....	.....	97.6	98.2
15 . . .	97.	99.0	99.6	100.2	.....	.....	98.2	.....
16 . . .	96.7	98.0	97.8	99.7				
17 . . .	.....	.....	96.4	.....				

In passing I will say that I use the Woodbridge tablets not because I consider them the *best*, but because I find them the most *convenient* means for administering the various antiseptics. When the patient cannot swallow tablets or capsules, I have found mixtures to answer equally well, though not so pleasant to take.

I am induced to think that because such emphasis is placed upon the diet and nursing in typhoid fever physicians are inclined to depend solely upon the expectant plan of treatment for medication. While no one recognizes more fully than I do the necessity of a carefully regulated diet and proper nursing in typhoid perhaps more than in any other disease, yet I feel sure that we are doing but half our duty to our patients unless we institute a scientific and definite method of medical treatment.

After a careful review of the literature of the subject, together with the theory of the principles involved, and reviewing my own experience, though comparatively limited, I feel that I cannot speak too strongly in favor of elimination and antisepsis in the treatment of typhoid fever. And, to repeat the words of Yeo, I would say that "the physician who in face of the evidence that has been accumulated neglects to promote intestinal antisepsis in typhoid incurs a very grave responsibility," and is lacking in the full performance of his duty to his patient.

BIBLIOGRAPHY.

Biggs, Park. American Journal of the Medical Sciences, March, 1897.
Schabad. Medical Record, October 8, 1898.
Welch, W. H. Medical Record, October 8, 1898.
Tyson, James. Practice of Medicine, Philadelphia, 1896.
Greene, Charles Lyman. Medical Record, November 7, 1896.
Umikow. Medical Record, May 7, 1898.
Henshow. Medical Record, September 26, 1896.
Yeo, I. Burney. Manual of Medical Treatment, Philadelphia, 1893.
Newton, Richard O. Medical Record, December 19, 1898.
Thistle, W. B. Medical Record, September 10, 1898.
Davis, Wesley. Medical Record, August 8, 1896.
Potter. Samuel O. L. Handbook of Materia Medica, etc., Philadelphia, 1897.
Jez. Medical Record, January 16, 1897.

DISCUSSION.

DR. PECK: With reference to Dr. Everitt's paper, I have been struck by the difference between the virulence of the disease in the soldiers and in those in our own community. It certainly looks as if the infection were more intense in Philadelphia. I had an interesting case of recurring chills in my own wards in which the chills occurred every day for five days. The blood was examined early for malarial organisms, but none were found. No quinine at all was given the patient. The case recovered quite promptly after means were taken to regulate the circulation. A case of this sort occurred in the Philadelphia Hospital during my term as Resident. The boy would have a temperature of 106° and 108°, rapidly rising and rapidly falling, and accompanied by great nervous disturbance. It seemed to me that these chills might be due to deep ulceration in the intestine.

In regard to Dr. Cotton's paper, it was extremely interesting as giving us a clear résumé of the two tests for diagnosis. I have had no practical experience; but in making the diagnosis the test of Ehrlich is not used, I fancy, as much in our work here. It seems to me that it might be of a good deal of value. The Widal test has been used in all the cases I have seen this year. The value of the Widal test is, I think, rather confirmatory, as we rely more on the consensus of symptoms in diagnosing typhoid fever. The patient's expression, temperature range, abdominal symptoms, and the eruption are of value. When these are typical we are never in doubt as to the diagnosis. In doubtful cases these tests would be of great value.

In regard to treatment, the definite lines of treatment outlined by Dr. Cotton in her paper have been used for many years. The hygienic and dietetic treatment are by most physicians thought to be most important. It seems our relation to antisepsis in typhoid fever is parallel to our relation to antisepsis in surgery. When we began the practice of antisepsis in surgery we used the strong antiseptics and hoped to destroy the bacilli of infection. Now, we have swung back and try to preserve our cases from the sources of infection. The dietetic treatment seems to me to be of prime importance. Any diet which will prevent the formation of gas is the ideal diet to choose.

The milk diet in the majority of cases is preferable, although several prominent physicians have of late advocated the use of more solid food as tending to better support the patient's strength. Few of us are willing to make experiments when we have seen the bad effects of indiscretion in diet.

The treatment with calomel is common and, I think, very valuable, and possibly acts as an antiseptic as favorably as any of the strong antiseptics. I like the old remedy, hydrochloric acid, because it seems to keep the stomach in good condition. Anything which will sustain the power of the organism will aid in resisting the disease. The stronger purgatives may lead to intestinal perforation, and we should be cautious in their employment.

Cases of prolonged fever have been mentioned by Osler, who for these cases advises getting the patient out of bed. He thinks the prolonged stay in bed may be the cause of the prolonged run of fever.

As to the cases reported by Dr. Cotton, I would like to say that they do not impress me as presenting the typical symptoms of early typhoid fever; vomiting is not a typical symptom of typhoid fever, but points to an infection of the gastro-intestinal tract. Very few of us feel that we can make a positive diagnosis of typhoid fever in two or three days, but rely upon the consensus of symptoms, and the development of these symptoms takes time. The question of diagnosis will confirm or invalidate the result of treatment.

Dr. Macfarlane: I have found the diazo reaction very successful in making positive diagnosis before the appearance of the spots. The percentage reported, I think, ought to have been higher. This was probably due to the number of soldier cases not being tested until the third or fourth week. The practice has been very useful in enabling me to make a diagnosis at the second visit. If I get the reaction I tell the family to take the patient to the hospital as quickly as possible.

DR. WENZEL: I have used the Widal test and find it confirmatory as to treatment. My experience has been chiefly with children among a class of people who make no attempt in the practice of hygiene. Calomel and soda have been my beginning treatment, one-tenth of a grain every second hour, after that hydrochloric acid.

DR. JONES: I am glad to have listened to Dr. Everitt's résumé of our interesting experience at the hospital with typhoid fever last winter, and would like to make some remarks on the thirteen cases occurring during my service. Perhaps the most interesting case was one admitted on November 6th which continued, with relapse, to January 16th. In that case there occurred some unusual symptoms. There was deep vasomotor disturbance and also Cheyne-Stokes respiration. The case began with violent vomiting and also developed arthritis of the left shoulder-joint, which is one of the well-known complications of typhoid fever. This case of relapse is the only one I have had in the Woman's Hospital.

I had one case of phlebitis which showed some pitting and some involvement of the lymph-channels. Albuminuria occurred in only one of my cases.

Among the women under my care was a case referred to by Dr. Everitt in which curettement had been done in the first month of pregnancy. The case was extremely interesting because of this complication. There was hemorrhage of the bowel, otitis media developed, there was great tympany, rapid pulse, all of which symptoms suggested the gravest condition.

I have been interested in the discussion as to the antiseptic condition of typhoid fever. I feel with my experience of typhoid fever that the abortive treatment of Woodbridge, as it is called, fails of the object. I have felt that while we can secure a certain amount of antisepsis, yet we do not limit the duration of the attack. I think it is a very important matter in treating typhoid fever to secure several stools by calomel in the beginning of the attack, and then to use only such food as the patient can digest. The stools should always be examined, and if they show any undigested material there is some fault with the feeding. I have felt that milk is the feeding *par excellence*, but only in such quantities as the patient can digest. It seems to me more of a question of digestion than resorption of toxins, and the antiseptics that we use do not prevent the resorption of the toxins from the bowels. I instituted while I was in my term of service sulpho-carbonate of zinc, which I thought as efficient an antiseptic as could be obtained, and in the cases for whom I used it it did considerable good, the action being to keep the bowel in healthy condition.

DR. ALLEN: In regard to the use of antiseptics, I have noticed quite lately some articles in the journals which deprecate the use of too much antisepsis at the same time that food is given, and affirm that when antiseptics are given as frequently as every hour they interfere with the digestive process. While antiseptics will destroy bacteria they also destroy the power of digestion, and that may account in some cases for undigested food being found in the stools; so it seems to me there is a limit. In regard to solid being better than liquid food, if given at all it seems to me it ought to be well ground up. It should be run through some kind of a chopper

which will destroy lumps. There is a chopper that has little holes at the end which I have used for patients who have very delicate digestion, and have run the food through about three times. It takes out all the fibre and leaves nothing but the wholesome part of the meat, and if one puts a little butter in it makes a delicate pat of meat for broiling. If vegetables are used at all they should be passed through a sieve, which will disintegrate them thoroughly.

DR. PRESLEY: I remember a case of typhoid fever in which the patient was exceedingly constipated. Small doses of calomel did not do, and I felt I must have the bowels thoroughly cleared before there was time for them to become tender. I risked giving her two compound cathartic pills. This condition, however, is, I think, the exception.

DR. EVERITT (closing): In the cases which I reported as having the paroxysm simulating malaria, with the exception of one case, all of these phenomena occurred after the temperature had returned to normal. I have been much interested in Dr. Cotton's cases, and to know that she has found the diazo reaction one year after the attack.

The antiseptics given in the hospital are not meant to kill the organisms, but to prevent enteric changes as far as possible.

In regard to the feeding, we found that we must deal with a large number of cases, and there was a great amount of work being thrown upon us, so that the matter of feeding became a serious responsibility. I should not advocate the routine feeding with milk, while I do think milk is the best thing if we are confined to one food. In dealing with a large number of men I had to attend very strictly to the convalescent diet. During the period of convalescence I ordered each individual meal for each individual man. Of course, that required an immense amount of attention. I would be glad of any routine during the run of the case which would lessen the amount of labor.

EPIDEMIC INFLUENZA.

BY MARY V. O'CALLAGHAN, M.D.,
WORCESTER, MASS.

THIS is the tenth consecutive year during which epidemic influenza has appeared. This epidemic began in 1889, after an immunity which had lasted nearly forty years, and it looks now as if it were to be one of our regular winter visitors.

These annual occurrences, although not so extensive as during the first two years, are still wide-spread enough to cause serious inconvenience, a very distinct addition to the death-rate, and a notable increase in chronic diseases, especially of the nervous system.

History. This epidemic made its appearance in St. Petersburg about October 15, 1889. By November 12th it had spread over the greater part of European Russia, nearly three-fourths of the whole population being attacked. Toward the end of November it broke out in Berlin. Professor Leyden estimates that one-third of the people in that city suffered. Then it spread throughout Germany, and by December 16th was present in every large German city from Hamburg in the north to Munich in the south.

Meanwhile the epidemic spread westward, making its appearance in Brussels, December 12th, and in Antwerp, December 16th. Cases were observed in Paris about the middle of November, but it did not become epidemic until November 27th, at which date 670 persons in one of the large shops in Paris were attacked. The French provincial towns did not suffer to the extent of the German and Russian, yet at Monte Carlo so many cases occurred as to seriously interfere with the engrossing occupation of gambling.

At Lyons and other cities of Central France, schools and colleges were closed or the openings postponed.

By December 12th the disease had crossed the Pyrenees, and appeared in Madrid on December 14th, one of the first victims being the little boy king. By December 29th most of the Spanish provinces were affected—the garrison towns most seriously.

It appeared in Lisbon and Oporto about the fourth week of December, prevailing extensively in both cities.

The Christmas holidays found it established in London, but it did not spread in this city with the rapidity it had shown in Berlin and St. Petersburg. At the same time a catarrhal distemper broke out among the horses in London. In one large stable one hundred horses were sick at the same time. Throughout Great Britain soldiers in garrisons suffered very severely. Among the life-guards at Windsor twenty to twenty-five men were daily reported off duty, and a like proportion among other garrisons.

The first outbreaks in the United States occurred in Boston, December 17th, in New York, December 20th and in Chicago, December 23d, then gradually westward until it reached the seaport towns of the Pacific.

In less than three months, therefore, it had extended from the eastern confines of Russia to the western borders of the United States, covering a great area, and with greater rapidity than any epidemic of which we have record.

When the disease first broke out in Russia it was thought we had to deal with a new disorder, but a little study of history proved the truth of the old adage : " There's nothing new under the sun."

Dr. Thompson, of England, finds undoubted records that a large number of like epidemics prevailed from 1810 to 1847, when it last visited England, and Dr. Hirsch carries his enumeration back to 1173. Descriptions of pests which attacked nearly everyone with cough, fever, racking pains in the head and limbs, but of which few died, justifies us in recognizing them as influenza. One such plague was referred to by Hippocrates and Livy in 412 B.C., but more explicit accounts have been handed down by Gregory of Tours, A.D. 591, and by others in the ninth and tenth centuries. During the next three centuries we read of only one epidemic, that of 1173, which spread over France, Germany, Italy and England ; but from 1327 it seems to have occurred much more frequently.

The name influenza, meaning some unknown influence, given by the Italians of the sixteenth century, seems to be the least objectionable. Catarrhus contagiosus, nervous fever, fog fever, la grippe, and our own vulgar "grip" are a few of its many titles.

When it first broke out some writers confounded it with dengue or the breakbone fever of Syria, but a study of both diseases soon showed they were not identical.

Causes. The progress of the disease seems to be from east to west, modified or diverted by mountain ranges and seas, but in no relation, if not actually opposed, to prevailing winds. The rapidity, almost suddenness, with which large numbers, even whole communities, were attacked in 1847 suggested aërial conveyance of the poison. In the new light given us by bacteriological researches we know now that influenza is due to a specific germ, but the pathogenic properties of this microbe have not yet been fully established.

In some serious cases the diplococcus pneumoniæ, and in others the streptococcus pyogenes and the streptococcus pyogenes aureus, have been found.

Examination of the blood shows most commonly small actively moving bodies, highly refractive, very similar to those found in pernicious anæmia.

In all epidemics, from the twelfth century to the present time,

peculiar meteorological conditions have prevailed. The atmospheric pressure undergoes rapid and wide variations from day to day, the temperature alternately warm and cold, the earth saturated with moisture, and the atmosphere damp, foggy and stagnant.

Such barometrical variations produce an altered condition of the bloodvessels and an irritable state of the nervous system, which predispose people to the absorption of any epidemic poison.

This influenzal poison spares no one; it respects neither age, sex, condition, nor occupation.

While it seems probable that the atmosphere is the most effective vehicle for conveying the poison, it may be communicated to a slight extent by infection, as in clothing, letters, etc., and to a greater extent by contagion from person to person.

The period of incubation is about two days. In the beginning of an epidemic—the so-called benign phases—the attack is only a troublesome, or, at most, slightly painful affection, which runs its course in two or three days, and ends in perfect recovery. This is due to the fact that the duration and intensity of the fever are not of a dangerous character, and delicate organs are not involved. These are cases of simple influenza, and persons in ordinary health are up and attending to business in three or four days—in fact, many persons despise the disease and refuse to be placed on the sick list. But later come the phases of complications, and now are noticed nervous symptoms and severe prostration out of all proportion to the fever, which is still transitory and of light degree. Nor does the poison always expend its force on the mucous membranes of the head and chest. In some persons it is the stomach and intestines which are attacked, leading to violent vomiting, colic and diarrhœa. In others, catarrhal symptoms are absent or present only to a slight extent, but physical and mental depression prevails to an extreme degree, the poison appearing to have a special selection for the central nervous system. Writers, therefore, describe the disease under three heads: the nervous, the catarrhal and the gastro-intestinal; and it is stated by many authorities that where there are no catarrhal symptoms convalescence is most prolonged.

Treatment. In a disease with clinical features so varied the remedies employed are of the most diverse nature. In all varieties a light diet and a free evacuation of the bowels should mark beginning treatment. Many practitioners treat their cases almost

as they do malaria: a full dose of quinine, 8 to 15 grains, in the onset of the fever, then tonic doses of this same drug throughout. Nor is this unwise medication, since in prolonged cases of influenza the spleen is enlarged and the disease shows a remittent character. Where headache and the neuralgic or rheumatic symptoms predominate pain must be allayed. Antipyrin, phenacetin, or the salicylates answer well here, care being taken to guard the weakened heart. For the insomnia, sulfonal, trional, or Dover's powder may be required. For prolonged nervous cases arsenic and nux vomica show good results, and for the anæmia, iron and magnesia.

In the gastro-intestinal variety salicylate of bismuth or magnesia will promote intestinal antiseptics; then opium in some form for the relief of colic and diarrhœa.

Where bronchial catarrh predominates antipyrin is contra-indicated, as it tends to diminish the fibrin-forming power of the already impoverished blood. Because of the danger of effusion into the pulmonary tract, iron in combination with some of the peripheral vascular stimulants, like sweet spirits of nitre or spirits of mindererus, will yield excellent results.

The cough that accompanies these catarrhal influenzas is of the dry, harsh variety that ordinary expectorants do little to allay. Oftentimes antispasmodics, like chlorodyne, act far better; but in many cases the cough does not improve until strength returns under tonic medicine and general restorative treatment.

When the catarrh is very severe lung troubles may supervene. The delicate ramifications of the bronchial tubes become involved, and bronchitis or bronchopneumonia develop; but these complications, though often severe, are usually well borne by persons who otherwise are in good condition. If, however, weak or old persons or little children become affected, these lung complications may prove fatal, and this is especially true of patients suffering from chronic cardiac and pulmonary troubles.

During the past winter no sick bed has been watched with more anxiety by the whole civilized world than that of the writer, Rudyard Kipling. His illness was not typical pneumonia, but one of those irregular forms which have become so common since 1889. Instead of rapid consolidation of lung tissue there was a gradual spread of the disease, the inflammation creeping from one area to another, one portion of the lung resolving while another was in its first stage. The great danger was that the prolonged

fever would exhaust the vital powers imperilled by the blocking up of the lungs, and the consequent strain put upon the heart. Luckily, the heart and lungs responded nobly to the test, but his little daughter's strength was not equal to the battle, and she succumbed.

Prophylaxis. It seems almost impossible to fortify ourselves against the invasion of this unseen atmospheric foe. Our best preventive is the maintenance of good health by avoidance of fatigue, of undue exposure, of insufficient food and sleep. Some physicians claim good results from the free use of antiseptics in the nose and throat. We should inculcate the necessity of wearing warm clothing, avoiding the depressing influence of cold, especially damp cold, and should warn the public against the indiscriminate visiting of homes where the disease prevails.

Convalescence. A conspicuous feature of the phenomena of epidemic influenza is the protracted duration of the convalescence.

This is manifested in persistent neuralgia, continual muscular weakness, fatigue on slight exertion, a feeble and rapid pulse, and in general a slow and halting recovery. These indications must be met on our part by blood and nerve tonics, easily digested food, change of scenery, rest from business cares—in fact, every means that we can employ to build up the impoverished system.

Another feature of the convalescent period is the tendency of old troubles to return. One physician tells of the return of an old crural phlebitis which had been at rest twelve years. Another speaks of an intolerable neuralgia of the foot in an old scar which was the result of a burn in childhood, ten years before. All of us have had many cases of old uterine inflammations starting up afresh after an attack of influenza.

I will close this brief paper by citing a few peculiar cases which I have met this winter :

CASE I.—Mrs. G., a very active woman, although nearly seventy years of age, had ordinary catarrh for two days. On the third day she passed into a sort of semi-coma, in which she remained three days. No fever, no increase of pulse. Nothing could be learned from an examination of the urine. She passed slowly out of this stupid condition, but it was two weeks before she took a keen interest in her surroundings, and more than a month before she had fully recovered.

CASE II.—Mrs. L., forty-five years of age, had an attack of

nervous influenza in the early part of February. At the end of two months of tonic treatment she is still unable to do her own housework, although she can illy afford to pay for help. She is morbid and inclined to melancholia. Pulse and temperature now normal, but she still suffers from insomnia. Her chief complaint now is a feeling of throbbing in the left inguinal region, which comes on several times a day at irregular intervals, and causes her great anxiety.

CASE III.—Mrs. S., aged thirty-two years, had simple influenza for three days. An imprudence brought on a relapse on the seventh day. This relapse was ushered in by a prolonged fainting spell. When reaction set in the skin of the whole body took on a scarlet-rash appearance. Vomiting was constant for twenty-four hours. On the following day herpes broke out over the upper and lower limbs, face, and buccal mucous membrane. Pulse slow, temperature subnormal. The eruption continued for three days. The patient made a good recovery. The skin desquamated at the end of the second week. When I saw her last week there was a purplish look in the skin of the hands and face, but the patient felt unusually well.

CASE IV.—Miss B., aged thirty-five years, had an attack of severe bronchial catarrh, but refused to remain in bed after the second day, although her cough was incessant and she felt weak. About the seventh day, while chatting pleasantly with friends, she complained of sudden dizziness and lost control of her lower limbs. She was carried up stairs, and for a week suffered severely from pains in the head and spine. It was with difficulty she could recall friends' names or events preceding her illness. She is still pitifully weak, inclined to hysteria, and has a haunting dread of insanity, and it will probably be many weeks before she can fill her old position as stenographer.

THE DETERMINATION OF SEX AT WILL.

BY J. GRIFFITH DAVIS, M.D.,
NEW YORK CITY.

MEDICAL journals and the lay press have recently contained many articles called forth by the writings of Dr. Schenck on the "Determination of Sex at Will." His theory is that the ruling

factor in determining sex is the food partaken of by the female. Several friends, members of the medical profession as well as patients, who have been cognizant of my work in this direction for the past twenty years, have urged me to state my experience, as facts well authenticated are more convincing than all the theories one can gather in a decade.

In an article published in the *Journal of the American Medical Association*, February 20, 1896, replying to one entitled "The Despised Office of Motherhood," I claimed that offspring should not come haphazard but as invited guests under the most favoring conditions of both parents, and the mother should determine the time and season for assuming the duties of maternity. Furthermore, given these factors, every true wife who loves her husband is willing, nay, anxious to bear children to him, barring physical defects for which she is not responsible. I have been advocating these measures for more than twenty years, and am now ready to testify to facts or results, although I can elucidate the "eternal why" only on general principles. I fully believe that "the great law of vibrations" is the only thing that will throw any light on the subject. We know that all demonstrations of force in nature (or the universe) are due to vibratory law. Therefore, I theorize that during ovulation the rate of vibrations in the female must be higher, rendering her positive and the ruling factor. It is logical, therefore, to conclude that the result of sexual association near this period will result in a female. *Vice versa*, when the rate of vibrations in the female is lowered and she becomes negative, so to speak, we argue that the male element will predominate in the latter association, and a male be the result. This I do know, that I have directed conditions that determined the sex every time. So much interested have I been in trying to settle this question that I have experimented with animals. One case I will report later. I cannot recall where or how I got my first idea of governing sex, but I knew a dog fancier who reared black-and-tan dogs for the market, and did not want females, as they were not salable. I learned that he shut the female up securely till she was nearly over her heat, then when she conceived her progeny were always males. When I was still young in the profession I found the majority of families desired equally boys and girls. I began to reason by analogy that what held good in the animal kingdom ought to hold good in the animal side of

the human being. Therefore, guests invited within forty-eight hours after the cessation of the menstrual period were invariably females, and decidedly so, little girls through and through, and I could show many photographs to prove this. Where male issue was desired, I advised continence from eight to ten days after the cessation of the menses, and have never known that to fail in producing male children. Just here I will relate a curious phenomenon. Where eight days were chosen the result in one case was a male, in another case a female. I had a chance to observe the two cases closely, and will state that the male child was decidedly feminine, while the female child was noticeably masculine, a regular "tomboy." I have, therefore, come to the conclusion that eight days is a pivotal point, so to speak, and I advise ten days' wait where male issue is desired. I have observed another fact, namely, that a guest invited within three days of an expected period will prove to be a female. This I argue is due to the vigor of the zoösperms and their powers to exist till the ovum is thrown off to be impregnated. Thus the same condition obtains as if sexual association occurred immediately after the period. Sometimes the period will be arrested, and when this happens I believe it will account in a measure at least for cases that seem to go two or three weeks past the usual time we are taught to tabulate for gestation. All the cases of this kind I recall at present were females. Of course, this presupposes that my patients are willing to practise self-denial or absolute continence for a certain number of days.

The majority of women are really immune (if I may be allowed to use this expression in this connection) from danger of conception from fifteen days after the cessation of the menses till three days before an expected period. I have watched one case through a period of years. In seven births five have been males and two females. Of these, two were twins, one a male and the other a female. At first, one would conclude that this was deviation from the rule. I feel sure it is not, for we know the ova are developed unequally. One may be retained several days after the rupture of the Graafian vesicle of the opposite side, hence the conception must take place for each one separately. I have not had an opportunity to test this fact fully, but I fancy where the ovum is double the conception would produce two of a kind. Where there was an interval the product of conception would occupy two

different amniotic sacs, and vary in sex. I could adduce a volume of evidence on "The Determination of Sex at Will," but will give only a few illustrative instances. The first cases date back over a period of twenty years. The first two cases were invited within forty-eight hours after the cessation of the menstrual period; both were females. In the third case a male was desired. The sexual associations occurred eight days after the cessation of the menses. A male resulted; he proved to be decidedly of a feminine type. My next case was a woman who had borne four sons. She stated that it was always ten days after her periods before she ran any risks of conception. She was very anxious for a daughter. I gave her my experience. Her next child was an invited guest within forty-eight hours after her period, and a daughter was the result. As she wished an equal number of both sexes three daughters followed in succession. My next case was a woman with two sons, who was very desirous of a daughter. Again the rule was proved correct. My next case was a woman who wished her first child to be a male. I gave her the rule, and she waited eight days, and to my chagrin the result was a female. The child was a very masculine type. This same woman, so anxious for a son, in due season made another effort, waiting ten days after her period, and a male was the result—and a very thorough male at that. I could readily prove all of these cases were it proper to divulge names under such circumstances. As an earnest physician, seeking to bring happiness as well as health to my patients, I have sought to aid them in every possible way toward this end. My next case was a woman who had borne a son through the most extreme suffering. Said she would not be willing to bear another child unless she could be sure of a daughter. As she was my patient at the time, I urged her to wait until she was in good condition, thoroughly well, and I would assist her to secure her heart's desire. Accordingly, at a stated period in accordance with rules laid down in so many cases, a guest was invited, and in due time a daughter came, the joy of the house. And, let me add, I cared for the woman all through the period of gestation, in every way sustaining her mentally and physically, with reference to her diet, baths, douches, etc. She was one of the most faithful, obedient patients I ever had. When parturition came it was an ideal case. She got through safely and with comparatively little suffering. She said she had

suffered as much with some of her menstrual periods in girlhood. I could multiply these cases indefinitely and show photographs to prove them, but I will only say to my professional fellows, "try these rules in your own clientèle and prove them."

All this presupposes a complete mastery of the situation and the ability of prospective parents to practise self-denial and moderation to secure results. As this is for professional persons directly, I will now relate my experiment in the animal kingdom (as I promised in the first part of my paper), where I could control the time. I had a beautiful female cat. My neighbor had an equally beautiful male. I was so situated that I could keep them apart till the female was nearly over her heat. She was allowed to associate with the male, and in just precisely nine weeks she gave birth to three males, which I reared. And here let me say these invited guests in the human as well as the animal kingdom were of a marked superiority over the ordinary haphazard progeny.

When you fully consider the matter you will realize that such results are natural and logical. Stock raisers study to breed animals under the very best conditions, which means intelligently controlled conditions. And only man, God's highest creation, is left to enter life regardless of any law except the civil code of the land. We think physicians should labor to overcome this state of affairs. They as a class have grave responsibilities in regard to the proper adjustment of the sexual relations. They alone are in a position to fully realize what momentous results follow the abuse of the sexual function not alone in the evils of licentiousness, so prevalent among the low and degraded, but also in suffering through want of knowledge among the otherwise intelligent and favored classes, who should be better informed. The physician stands at the gate of life as well as at the gate of death, and shall he not guide toward the best in life as well as away from the pain and sharpness of death? I try to instruct prospective parents in regard to their moral as well as physical influence over the child to be, trying to make them understand that the immortal soul they are invoking out of eternity, not coming of its own volition, has a right to the very best of their natures—moral as well as physical—and they are in duty bound to seek wisdom, and govern themselves accordingly.

Some may think the ideas herein advanced are Utopian. I

assure you they are thoroughly practical, and I believe legitimate. It is always lawful to obey law ; and if we have discovered a law of our being we can rejoice in the knowledge. God has given human beings reason, and they therefore should aim to lift the sexual relations above the plane of ignorant impulse and blind instinct. The regeneration of the race depends upon how God's munificent laws are observed and obeyed, and those who are law abiders are always the happiest and most successful people.

U. HOLZER
BINDER
BOSTON, MASS.